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DISEASES CAUSED BY BACTERIA AND FUNGI.

HOLTH, H. (1934). **Tubercle Bacilli in Fowl as Cause of Progressive Tuberculosis in Cattle. Transformation of the Bacilli in the Direction of the Bovine Form.**—*Acta path. et microbiol. scand.* Suppl. 18. 126-142. 8 tables. [Orig. in English]. [*Verbatim* translation in *Maanedsskr. Dyrl.* **46.** 65-74].

This paper describes the investigational work following the finding of a case of rapid tuberculous emaciation in a cow from a tuberculosis-free herd in Norway. There were advanced tubercles in the lungs and lesions in the mesenteric lymph glands. Bovine tuberculosis is almost unknown in Norway and, mainly on that account and on evidence that tuberculosis was present among the poultry on the same farm, the author concluded that this was a case of avian tuberculosis.

A series of experimental animals (rabbits, guinea pigs and calves) were inoculated and subinoculated with material from the cow and confirmed the tuberculous origin of the lesion. Comparative tuberculin tests in two calves with avian and bovine tuberculin seemed to show that the strain gradually changed from the avian to the bovine type in its passage.

Subsequently the remaining cattle at the farm were tuberculin tested on two occasions and two reactors were found at each test, three animals presenting small lesions in the lymph glands and the fourth no visible lesion.

The strain isolated in the experimental animals was not definitely typed.

The author urges that all tuberculosis eradication schemes should include all domestic animals and not only cattle, owing to the occurrence of infection by a heterologous type of organism.—J. E.

I. FAGOT. (1933). La défense contre la Tuberculose bovine en Belgique. **[Control of Bovine Tuberculosis in Belgium].**—*Echo vét.* **62.** 68-77 and 94-104. 1 table.

II. —. (1933). **The Eradication of Bovine Tuberculosis.**—*Lancet.* **225.** 1043-1045. [1 ref.]

III. —. (1934). **The Eradication of Bovine Tuberculosis.**—*J. Roy. Army Med. Corps.* **62.** 121-125.

IV. FOX, H. (1934). **The Nature of Tuberculosis in Animals: The Basic Principles for the Control of the Disease.**—*Univ. Pennsylvania Bull. Vet. Exten. Quart.* **34.** 1-5.

I. This is a general survey of the campaign organized against tuberculosis in Belgium and of the progress achieved during recent years. It is of interest to note that, in an attempt to expedite the eradication of the disease, free tuberculin testing of cattle was introduced in 1930 by the Ministry of Agriculture, but this

concession had unfortunately to be discontinued in 1932 on account of the general financial situation.

II. It is pointed out that the Tuberculosis Order (1925) can never lead to any marked reduction in the general incidence of tuberculosis. The article refers to the work of JORDAN in Scotland on the eradication of the disease [this *Bull.* **4.** 310].

III. This is a consideration of the dangers of milk containing bovine tubercle bacilli, with special reference to the work of JORDAN in Scotland on the eradication of the disease.

IV. Fox discusses the susceptibility of different species of wild animals to tuberculosis and the types of lesions observed in them.—T. M. DOYLE.

I. MOUSSU, M. G. (1932). Prémunition antituberculeuse par BCG. Réponse de quelques Bovins vaccinés. [**Vaccination of Cattle with BCG**].—*Rec. Méd. vét.* **108.** 465-469.

II. —. (1932). **The Results of BCG Vaccination.**—*Brit. Med. J.* July 23rd. 156-158. [1 ref.]

I. Moussu records the history of eight heifers, seven on one farm and one on another, that were vaccinated with BCG. The seven heifers [apparently of unknown history] were purchased at 12 to 14 months of age : they were subjected to one tuberculin test and all successfully passed and were then inoculated subcutaneously with BCG.

Two years later one animal was slaughtered on account of an accident. Tuberculous lesions were found in a mesenteric and in a mediastinal lymphatic gland. After a further two years a second animal was slaughtered for meat purposes and on inspection the carcass was condemned on account of tuberculosis. Four others were slaughtered and two showed small discrete tuberculous lesions and two were healthy.

The eighth heifer, on the second farm, was inoculated at birth with BCG and fed on the milk of a cow that had passed the tuberculin test. The heifer was slaughtered at two years of age on account of a swelling in the throat. She was in good condition but on autopsy tuberculous lesions were found in the pharyngeal and mediastinal glands.

II. This is a review of a report published by the Institut Pasteur, Paris on the effect of prophylactic vaccination with BCG in France.

It refers to the difficulty of assessing the value of the vaccine for the human subject.—T. M. DOYLE.

LAMONT, H. G., KERR, W. R., & SHANKS, P. L. (1932). **Report on Experiments with Mr. Henry Spahlinger's Anti-Tuberculosis Vaccine.**—*Vet. Rec.* **12.** 1471-1477. 6 tables, 6 charts.

This report is issued at the instigation of the Ministry of Agriculture, Northern Ireland, and describes in detail the technique of the experiments carried out on one group (group 3) out of five which were used. The group consisted of 11 animals and was subdivided into four sub-groups, 3A, 3B, 3C and 3D.

The actual vaccination of these animals was carried out in all sub-groups by Mr. Spahlinger himself, except sub-group 3C, the members of which received the vaccine intramuscularly and this was carried out by one of the authors of the report.

The age, breed and care of the animals are given and the vaccine used, which is described as " new " vaccine, was administered intravenously, subcutaneously and intramuscularly. The fourth sub-group received the vaccine with olive oil subcutaneously.

Certain experiments were carried out with a view to ascertaining the virulence of certain cultures for cattle and the method of preparing the test dose is described. Then follows the method of administration of the test both to vaccinated animals and controls (the intravenous route being selected), subsequent history to date and a brief summary of the results observed.—G. W. DUNKIN.

AYNAUD, M. (1934). Suppuration caséeuse du Mouton à *Bacterium purifaciens*. **[Caseous Suppuration of the Sheep due to** *Bact. purifaciens***]**.—*C. R. Soc. Biol. Paris.* **115.** 5-6.

VELU, H., & ZOTTNER, G. (1934). Bacilles pyogènes du Porc et du Mouton. **[Certain Pyogenic Bacteria of the Pig and the Sheep]**.—*Ibid.* 17-18. [2 refs.]

VELU, H., & ZOTTNER, G. (1934). Caractères culturaux comparatifs des Bacilles pyogènes du Porc et du Mouton. **[Differential Characteristics of Certain Pyogenic Bacteria of the Pig and Sheep]**.—*Ibid.* 594-596. [1 ref.]

Aynaud gives an account of three outbreaks in sheep characterized by local abscess formation on the head and the neck. The cultural and biological reactions of the causal organism, *Bact. purifaciens*, are briefly described and it is stated that the cultures were of low pathogenicity for experimental sheep.

Velu and Zottner consider that whilst *Bact. pyogenes* derived from the pig presents certain affinities with corresponding strains from cattle and sheep, the porcine organism should be regarded as a distinct entity. They point out that the pig strains are very difficult to grow and can only be maintained in culture under anaerobic conditions, liver broth under oil giving the best results. On solid media it grows only on serum agar in an anaerobe jar. The various sugar reactions are indicated.—R. E. GLOVER.

TOMASEC, I. (1933). Pokusaj aktivne imunizacije protiv kolere peradi sa oslabljenim kulturama B. aviseptici. **[Immunization against Fowl Cholera by Attenuated Vaccine]**.—*Vet. Arhiv.* **3.** 81-99. 7 tables. [12 refs.] [Abst. from French summary].

A vaccine was made by attenuating *Pasteurella aviseptica* by transplantations three or four times a day on bile broth. After 70 passages, the strain lost its virulence for fowls and ducks, was still irregularly virulent for turkeys and geese, and regularly virulent for pigeons. The vaccine was tried on fowls experimentally, a dose of 0·5 to 1 c.c. of bile broth cultures being used. The general reaction was rather severe, but immunity was apparent after two days and strong after five days. Infection tests after two months showed that immunity had waned. This loss of immunity was, however, prevented by further vaccination with two doses at ten day intervals and field trials with this method gave good results, but it is not yet known how long the immunity lasts.—J. E.

—. (1933). **Report of the Conference of Official Research Workers in Animal Diseases of North America on Standard Methods of Pullorum Disease in Barnyard Fowl November 29, 1932.**—*J. Amer. Vet. Med. Ass.* **82.** 487-491.

This report was submitted and it was proposed that the recommendations contained therein should constitute the official methods of the Conference of Official Workers in Animal Diseases.

(1) The only criterion of infection with *Salmonella* [*Bact.*] *pullorum* shall be the isolation of this organism from the blood and body tissues of suspected chickens and its complete identification. The technique of the *post-mortem* examination, isolation and identification of the organism is given in detail.

(2) Serological diagnosis of pullorum disease (carrier condition) in maturing and in adult breeding stock : the macroscopic tube agglutination test shall constitute the official method. The method of collecting the blood samples and the delivery to the laboratory is detailed, also the preparation of the nutrient agar for antigen production and the preparation of an antigen which consists of three representative strains of *Bact. pullorum* which are of known high agglutinability. These strains are not sensitive to negative or to non-specific sera.

Either 1 : 25 or 1 : 50 dilutions of the test serum may be employed. The 1 : 25 dilution should not be used to condemn a flock which has been placed on a free or accredited list unless at autopsy the organism is found.

—NORMAN DOBSON.

I. HOLTH, H. (1933). **Immunisation Experiments and Vaccine Treatment in Infectious Abortion.**—*Skand. Vet.-tidskr.* **23.** 557-602. 14 figs., 1 table. [2 refs.] [Orig. in English : Swedish summary].

II. WALL, S. (1933). **The Importance of Bacterin Treatment in Combating Infectious Abortion in Cattle.**—*Acta path. et microbiol. scand.* Suppl. 16. 543-548. 2 tables. [Orig. in English].

I. Holth (1911) reported favourable results from the use of killed vaccines and filtrates of *Br. abortus* cultures in the immunization of rats against artificial infection with *Br. abortus*. Immune serum also protected rats and mice while bacilli subjected to the action of immune serum were shown to have lost their pathogenicity for rats and mice.

The author now reports that *abortus* cultures treated with antiformin (0·5 to 10 per cent.) and formalin (0·5 per cent.), and culture filtrates failed to protect guinea pigs against artificial infection.

Immune sera prepared from rabbits and sheep by the injection of cultures treated with antiformin and formalin, and culture filtrates, were found to have little or no protective value for guinea pigs against artificial infection. Suspensions of *Br. abortus* treated with antiformin and formalin appeared to have some curative value for infected guinea pigs.

A heifer inoculated subcutaneously with 10 c.c. of a suspension of bacilli treated with 0·5 per cent. antiformin failed to resist three drops of a virulent culture instilled into the eye and aborted a six-month-old foetus. A control heifer also aborted. However, while the vaccinated heifer remained in good condition, the control was affected with fever, lost heavily in condition and made a slow recovery.

In a second experiment three heifers were given multiple doses of vaccine and a fourth animal was kept as a control. The four animals were inoculated subsequently with virulent culture. The control and one of the vaccinated heifers aborted and the other two vaccinated animals carried their calves to full term.

The author concludes : " The experiments seem to show that vaccine treatment carried out in the manner described exerts a very palpable influence. Even if abortion-infection cannot always be prevented thereby yet the curative powers of the vaccine will make themselves felt and will in some degree check the development of pathological processes and this will be manifested by, *inter alia*, a milder course of the disease with small disturbance of the general health."

II. Wall recommends the use of bacterin (*Br. abortus* cultures killed by holding for five minutes in steam at 100°C. and suspended in a solution of phenol) for the control of contagious abortion. He claims that bacterin confers a good immunity and reduces considerably the incidence of abortion.

Infected pregnant animals should not be inoculated.—T. M. DOYLE.

I. WILSON, G. S. (1933). **The Classification of the Brucella Group : A Systematic Study.**—*J. Hyg. Cambridge.* **33.** 516-541. 15 tables. [45 refs.]

II. TAYLOR, R. M., LISBONNE, M., & ROMAN, G. (1933). **Classification by the Bacteriostatic Action of Dyes and H_2S Production (Huddleson) of Brucella Strains Isolated in France and the Epidemiological Implications thereof.**—*1er Congr. internat. Hyg. méditerranéenne, 1932.* **1.** 706-713. 2 tables. [2 refs.] [Orig. in English].

I. This is a critical survey of the methods in general use for the differentiation of the members of the brucella group. It is based on the author's considerable experience of the subject and, in the present instance, on a study of more than 300 strains of *Brucella* collected from various parts of the world.

Wilson discusses the differential value of the morphology of the organisms, pigmentation, crystal formation, glucose utilization, sensitivity to CO_2, hydrogen sulphide formation, dye sensitivity, thermo-agglutination and serological tests.

Morphological appearances, abundance of growth in culture, pigment formation, the appearance of crystals in the medium, the production of alkali in peptone water or the utilization of glucose were found to be of little value for the purpose of differentiation.

Most bovine *abortus*, *para-abortus* and American porcine *abortus* strains produce H_2S freely for three or four days, while *melitensis*, *paramelitensis* and Danish porcine *abortus* fail to produce any or more than a small quantity on the first day only.

The dye sensitivity method of Huddleson was found to be of considerable value in differentiation and is the only certain method available for distinguishing between bovine and porcine *abortus* types. By its use *Brucella* strains may be classified into three main groups—bovine *abortus* and *para-abortus*, porcine *abortus* and *melitensis* and *paramelitensis*.

Thermo-agglutination is mainly of value in detecting antigenic roughness. For the main groups of strains serological methods proved to be the most valuable for the allocation of individual strains.

" In view of the existence of numerous sub-groups, it is unjustifiable, in the classification of individual Brucella strains, to rely on any single method of examination.

" Every strain should, if possible, be examined for CO_2 sensitivity, for H_2S formation, for growth in the presence of thionin, basic fuchsin, methyl violet and pyronin and for antigenic structure."

II. Taylor, Lisbonne and Roman have studied the value of the dye tolerance tests and the production of H_2S for the differentiation of the members of the brucella group. They conclude that it is possible to classify a large percentage of brucella strains into definite types by these methods and epidemiological findings suggest that the types thus differentiated correspond with certain pathogenic attributes.—T. M. DOYLE.

PEDERSEN, H. O. (1933). Histologiske Undersøgelser over det normale og inficerede Kvieyver. [**Histology of Normal and Infected Cows' Udders** (*Br. abortus* **and Staphylococci**)].—*Skand. Vet.-tidskr.* **23.** 603-624. 13 figs., 2 tables. [Summary in English : abst. from orig.]

Eight heifers, 14 to 20 months old were inoculated subcutaneously with *Br. abortus*. They were killed two to three and a half months later, their udders were examined histologically and the changes were observed in detail and are illustrated by photo-micrographs. The first change observed was focal infiltration with leucocytes, and the alveoli showed signs of secretory activity. As the lesion progressed, the cellular infiltrations increased in number and size and the inflammation tended to become localized in the larger secretory ducts.

In three of these animals staphylococcus culture was also injected into the teat canal of one quarter, but the changes produced were only temporary and cleared up in a week.—J. E.

VIRIDÉN, P. (1933). Agglutinationsvärden i besättningar smittade av sjukdomen smittsam kreaturskastning, undersökta två gånger med ett års mellantid mellan undersökningarna. [**Agglutinin Titres in** *Br. abortus*-**Infected Herds Tested at an Interval of One Year**].—*Skand. Vet.-tidskr.* **23.** 646-661. 1 table. [3 refs.] [Abst. from English summary].

An account of the control of *Br. abortus* infection in eight herds. The author deals with the usual principles involved.—J. E.

ZINTH, M. (1933). Das Kulturverfahren zum Nachweis von Abortus-Bangbazillen in Meerschweinchenversuch. [**Culture Methods for** *Br. abortus* **Infection in Guinea Pig Tests**].—*Inaug. Diss. Giessen.* pp. 30. 4 tables. [31 refs.]

Br. abortus was isolated culturally from the precrural lymphatic glands of guinea pigs seven to 14 days after the subcutaneous injection of contaminated material. Cultural examinations gave positive results more often than agglutination tests performed at the same time.—E. J. PULLINGER.

DISEASES CAUSED BY PROTOZOAN PARASITES.

I. PATTERSON, F. D. (1933). **The Viability of Coccidial Oocysts.**—*Tuskegee* [*U.S.A.*] *Indust. Inst. Div. Vet. Sci. Tech. Bull.* **1.** No. 2. pp. 19. 9 figs. [18 refs.]

II. YAKIMOFF, W. L., GOUSSEFF, W. F., MEZWETAIEFF, M. W., & RASTEGAÏEFF, E. F. (1933). Biothermische Zerstörungsmethode der Coccidienoocysten. [**Biothermic Method of Destroying the Oocysts of Coccidia**].—*Arch. wiss. prakt. Tierhlk.* **67.** 167-175. 3 tables. [10 refs.]

III. ANDREWS, J. (1933). **Chemical Treatment of Litter as an Aid in the Control of Rabbit Coccidiosis.**—*J. Parasitol.* **20.** 100-102. [Proc. Helminthological Soc. Washington. 155th Meet.]

I. This pamphlet records experiments on the viability of *Eimeria tenella* of the fowl in soil and faeces under varying conditions of moisture and exposure to sunlight. In soil in which the humidity was maintained and in soil weathered under natural conditions, the oocysts remained infective up to 24 weeks and ten weeks respectively, the maximum periods tested. In soil in which the moisture was allowed to evaporate the power of infection was lost after ten weeks. Oocysts mixed with soil to which 10 per cent. unslaked lime was added were infective up to 12 weeks, the maximum period tested. Infection persisted in soil refrigerated at 7°C. and in frozen soil for 23 weeks. Oocysts in the surface soil in petri dishes caused infection of fowls after exposure to sunlight for nine hours, but all infections resulting after exposure for seven hours were so mild that they were only recognized at autopsy. Faeces, dried in the absence of sunlight, or decomposed in sealed tubes, failed to infect after three weeks. Oocysts in caeca allowed to decompose in sealed tubes failed to infect after two weeks.

II. This article records experiments on the destruction of the coccidia of rabbits and sheep in manure pits containing horse dung, cow dung and mixed dungs. The fresh faeces of rabbits and sheep infected with coccidia were wrapped in paper and buried 60 cm. deep in the pits and allowed to remain for periods

varying from 15 minutes to six hours. On removal, the faeces were divided into two parts, one part being examined microscopically for evidence of alteration, and the other part mixed with 2·5 per cent. potassium bichromate solution and allowed to sporulate. Failure to sporulate and the staining of dead organisms by the bichromate solution were accepted as evidence of destruction. The temperature of the pits varied from 52° to 68°C.

Exposure for three hours to the heat of pits of cow or horse dung prevented sporulation, whilst in the mixed dung pit one and a half hours was effective. In the last case, some organisms appeared to be unaltered, but no sporulating parasites were found.

III. This article records experiments on the spraying of litter containing coccidial oocysts of rabbits with a mixture of high boiling coal-tar acids and light mineral oils, known commercially as "toxite." In the largest scale experiments, 30 rabbits were divided into two lots, the pens were infected with oocysts, and in one lot the pens were sprayed weekly with "toxite." In the sprayed pens, five rabbits died, all of which showed coccidial infection, but only two showed pathological lesions of coccidiosis. In the unsprayed pens, all 15 rabbits died, and in 11 animals coccidiosis was considered to be the primary cause of death. The author considers that "toxite" spraying is an effective aid in the control of rabbit coccidiosis.—U. F. Richardson.

I. Perin, M. (1932). La coccidiose du lapin et du cobaye et son traitement par le lactosérum et les dérivés du lait. [**Coccidiosis of the Rabbit and Guinea Pig and its Treatment with Whey and Milk Derivatives**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 96. [77 refs.]

II. Hindle, E. (1933). **Isospora bigemina from the Dog.**—*Proc. Roy. Soc. Med. London.* **26.** 204. [1 ref.]

III. Henry, A., & Masson, G. (1932). La coccidiose du dromadaire. [**Coccidiosis in the Dromedary**].—*Rec. Méd. vét. exot.* **5.** 185-193. 6 figs. [5 refs.]

I. This thesis is a review of the literature upon the subject and lays no claim to originality.

II. The identification of the oocysts of *Isospora bigemina* in the faeces of a dog suffering from dysentery is recorded.

III. The author describes a case of coccidiosis in an aged dromedary, the organism being believed to have caused the animal's death. The lesions were confined to the mucous membrane of the lower part of the small intestine. The causal parasite closely resembled the horse coccidium, *Globidium leuckarti.* It was remarkable in that the schizonts and microgametocytes attained a diameter of 350μ, the oocysts measured 80 to 100μ by 63 to 94μ, the micropyle was 12 to 14μ in diameter and the capsule 10·4μ to 15·6μ in thickness. The name *Globidium cameli* is suggested.—R. S. Roberts.

I. Velu, H. (1933). Existe-t-il des rechutes dans la Theilériose Nord-Africaine. [**Do Relapses occur in the Theileriasis of North Africa?**]—*Rev. vét. milit.* **17.** 303-306. [2 refs.] [Reported *verbatim* in *Bull. Soc. Path. exot.* **26.** 779-781. [2 refs.]

II. Miegeville, M. (1933). Quelques cas de theilériose après prémunition. [**Some Cases of Theileriasis after Premunition**].—*Bull. Soc. Path. exot.* **26.** 775-778.

I. Velu brings forward strong circumstantial evidence that a resuscitation of theileria parasites sometimes occurs in adult native cattle, presumably tolerant to the infection, when subjected to conditions that lower the vitality.

Similar incidents have been reported from Egypt, India, Anatolia and Transcaucasia.

In the cases recorded by Velu recrudescence apparently occurred as the result of anthrax infection. He refers to the investigations of DU TOIT who endeavoured by various expedients, but without success, to bring about a recrudescence of theileria infection in animals recovered from East Coast fever [*Th. parva* infection].

II. Miegeville reports nine cases of theileriasis, of which two were fatal, among 23 imported French cattle.

The cattle were imported in October and inoculated the following month against anaplasmosis and *Babesia bigemina*. They were then put on pasture until the beginning of April when they were inoculated against theileriasis. Three months later the first case of theileriasis occurred. The author concludes that the cattle were heavily infected by the inoculation and that a resuscitation of the parasites was induced by some adverse circumstance.

[There is strong evidence that animals recovered from the theileria infection that exists on the Mediterranean littoral may become carriers of the infection for indefinite periods and, if subjected to adverse influences (inoculation against rinderpest, anthrax, etc.), failures in the tolerance to the infection may occasionally occur. There is, however, no reliable evidence that animals recovered from *Th. parva* infection become carriers. An attack of the disease apparently confers a strong sterile immunity].—T. M. DOYLE.

I. REES, C. W. (1933). **Splenectomy in Cattle and Sheep in Relation to Anaplasmosis.**—*North Amer. Vet.* **14.** No. 4. 23-31. 1 table, 5 charts. [3 refs.]

II. SERGENT, E., DONATIEN, A., PARROT, L., & LESTOQUARD, F. (1933). Etude expérimentale de *Anaplasma centrale* Theiler, du Boeuf. [**An Experimental Study of** *Anaplasma centrale* **Theiler in Cattle**].—*Bull. Soc. Path. exot.* **26.** 922-924. [2 refs.]

III. DIKMANS, G. (1933). **Anaplasmosis. VI. The Morphology of Anaplasma.**—*J. Amer. Vet. Med. Ass.* **83.** 203-213. 38 figs. [6 refs.]

IV. REGENDANZ, P. (1933). Die Uebertragung von Anaplasma durch *Boophilus microplus*. [**The Transmission of Anaplasma by** *Boophilus microplus*].—*Zlb. Bakt. I.* (*Orig.*). **130.** 214-220. 12 figs. on 1 plate. [13 refs.]

V. YAKIMOFF, W. L. (1933). L'*Anaplasma marginale* en Russie (U.d.R.S.S.). [*Anaplasma marginale* **in Russia (U.S.S.R.)**].—*Bull. Soc. Path. exot.* **26.** 1260-1261.

VI. BOYNTON, W. H., & WOODS, Gladys M. (1933). **Deer as Carriers of Anaplasmosis.**—*Science.* **78.** 559-560. [1 ref.]

I. This article records the results of splenectomy carried out on four sheep and 22 cattle in the course of investigations into anaplasmosis in Louisiana, U.S.A. Splenectomy of sheep did not reveal anaplasm infection and the inoculation of infected ox blood into splenectomized sheep did not cause a reaction. Splenectomy of cattle confirmed the general results of DE KOCK and QUINLAN in South Africa. Of 22 experimental animals splenectomized, 20 suffered a relapse to anaplasmosis and six also showed a piroplasm infection. Anaplasms could not be demonstrated in two animals and on exposure to infection they contracted a fatal anaplasmosis. The relapses to anaplasmosis were mild and the appearance of anaplasms in the blood varied between three and 28 days from the date of operation. In some cases it appeared that the operation led to an increased virulence of the parasite as five subinoculations produced fatal disease, but this result did not occur in all cases.

II. This article records investigations in Algiers into the characters of a strain of *A. centrale* received from Kenya. The disease produced on calves inoculated with the strain was mild, and fever only occurred in one-third of the experimental animals. No mortality occurred, but the infections persisted for long periods. The virus remained infective in defibrinated blood for at least 21 days.

Carriers of *A. centrale* did not react to reinoculation with the same parasite, but they reacted severely to inoculation with Brazilian and Algerian strains of *A. marginale*. No deaths occurred from these inoculations into carriers of *A. centrale*, but in two out of 12 controls fatal infections occurred.

III. This article records attempts to cultivate anaplasms in defibrinated or citrated blood to which 1 per cent. of a 50 per cent. dextrose solution was added. Appearances indicated that multiplication within the red corpuscles occurred in the cultures. The objection that such appearances might be due to bacterial contamination was excluded by subcultures on nutrient agar. It could not be ascertained whether cultivation led to the invasion of new corpuscles. No increase in the number of anaplasms could be detected in cultures made from the blood of recovered animals.

IV. The author doubts the previous records of the hereditary transmission of anaplasms by ticks and draws attention to his own failure to infect an animal in Hamburg with larvae of *Boophilus microplus* descended from ticks which had fed on infected cattle in Brazil. This animal was proved susceptible by inoculation and, while anaplasms were showing in its blood, larvae, nymphs and imagos of *B. microplus* were fed on it. On examination of these ticks, bodies were found in the salivary glands which appeared to be anaplasms as they corresponded with the forms seen in the blood and were only found in ticks which had fed on infected animals. The bodies in the salivary glands sometimes consisted of single granules but in most cases consisted of masses of nuclei which appeared to lie in a structureless, non-staining matrix and probably represented centres of multiplication. No such bodies could be detected in the intestinal contents, intestinal wall, ovary or eggs of the ticks.

B. microplus is a one-host tick, but the ticks do change position on the host and it is suggested that they may transmit the disease by falling to the ground during a change of position and then climbing on to a new host.

V. This note records the detection of *A. marginale* in the blood of some Hereford cattle at Uralsk. Anaplasms previously recorded from Russia have been ascribed to the species *A. rossicum*.

VI. This article records experiments on the possibility of deer acting as carriers of anaplasmosis in America. A black-tailed buck and a Rocky Mountain mule deer, obtained from areas where anaplasmosis was unknown, were examined for anaplasms and proved free from infection by the failure of their blood to infect cattle. On inoculation with blood from infected cattle no symptoms developed and no marginal points were detected in the blood except in one instance when they were too rare to be regarded with more than suspicion. On the subsequent inoculation of the blood of both deer into cattle, typical anaplasmosis was produced. In one case the blood proved infective six months after the infecting inoculation. Ticks are commonly encountered on deer, and the black-tailed buck of this experiment harboured *Dermacentor occidentalis*, *D. parumapestis* and *Ixodes ricinus californicus*.—U. F. Richardson.

I. Coles, J. D. W. A. (1933). **Mortality in Fowls due to** *Aegyptianella pullorum*. —*Onderstepoort J. Vet. Sci. & Anim. Indust.* **1**, 9-14. 7 figs. [1 ref.]

II. BEDFORD, G. A. H., & COLES, J. D. W. A. (1933). **The Transmission of *Aegyptianella pullorum*, Carpano, to Fowls by means of Ticks belonging to the Genus *Argas*.**—*Ibid.* 15-18.

I. The author records three outbreaks of aegyptianella infection in one of which a heavy mortality occurred among young chicks. There was some evidence that *A. pullorum* may kill older fowls, but apparently not to the same extent as *Spirochaeta anserina*. An attempt to transmit the disease by infected *Argas persicus* to chickens three to eight weeks old was unsuccessful.

The main symptoms observed in chicks were inappetence and diarrhoea. Icterus occasionally occurred. At autopsy chicks show icterus, anaemia, enlargement of the spleen, fatty degeneration of the liver, intestinal catarrh and a characteristic pale greenish yellow colour of the kidneys.

II. Bedford and Coles successfully transmitted *A. pullorum* to healthy chickens by adult *Argas persicus* ticks which had previously fed on infected chickens. The shortest period between feeding on an infected bird and on a healthy chicken was 26 days. One infected adult tick successfully infected two healthy chickens. An infected adult *Argas persicus* tick may remain infected for at least 162 days. Attempts to transmit the infection with *Argas moubata* and *Argas perengueyi* were unsuccessful.—T. M. DOYLE.

I. CIUCA, A. (1933). La Dourine. **[Dourine]**.—*Bull. Off. internat. Epiz.* **7.** 168-194. [6 refs.]

II. CIUCA, A. (1933). Etude de la dourine. **[Dourine]**.—*Ibid.* 327-333.

III. MOULIS, H. (1933). La Dourine. **[Dourine]**.—*Thesis for Docteur vétérinaire, Lyons.* pp. 66. [44 refs.]

IV. ZOTTNER, G. (1934). Technique de la déviation du complément par antigène alcoolique stable dans le diagnostic de la dourine. **[Diagnosis of Dourine : Complement-Fixation Test using a Stable Alcoholic Antigen]**.—*C. R. Soc. Biol. Paris.* **115.** 366-367. [1 ref.]

I & II. A comprehensive survey of existing information on dourine. The author deals with the clinical manifestations, diagnosis and treatment of the disease. In a discussion on this paper BOES stated that during an outbreak of dourine in 1921-1922 in Belgium it was observed that 30 per cent. of foals, the progeny of infected dams, contracted the infection through the milk.

III. A general survey of the subject.

IV. Zottner reports satisfactory results with the complement-fixation test in the diagnosis of dourine by the use of an alcoholic antigen.—T. M. DOYLE.

CLARK, H. C., CASSERLY, T. L., & GLADISH, I. O. (1933). **Equine Trypanosomiasis—" Murrina " or " Derrengadera." Some Notes on the Disease in Panama.**—*J. Amer. Vet. Med. Ass.* **83.** 358-389. 7 tables. [8 refs.]

This article gives a complete description of equine trypanosomiasis due to *Tryp. hippicum* as encountered in Panama. Some interesting notes are given on the control of the disease in an infected stud and on the measures which might be adopted to prevent serious spread in Panama, or from that area to Mexico and the United States. The authors are inclined to agree with WENYON that *T. hippicum* is identical with *T. evansi*.

The first cases in a stud usually escape detection as significant symptoms do not develop for a few weeks. An emaciated animal with fever, a staggering gait and a good appetite should be treated with suspicion. It is known that the vampire bat is the transmitting agent, but the importance of mechanical transmission by coitus, biting flies and even by rubbing together in crowded corrals is stressed.

Cattle are susceptible to infection (4·5 per cent. of a herd of cattle grazing with infected mules were found to harbour the parasite) but show no symptom of disease. In adopting control measures it is most important that cattle and horses should not be grazed together.

For the detection and segregation of infected animals, the daily examination of thick blood films combined with the complement-fixation test is recommended. In only one case did the inoculation of a guinea pig reveal infection when microscopic examination was negative. The complement-fixation test, carried out on the same lines as the test for dourine, gave a positive result 16 days after the infective inoculation of an experimental animal and gave satisfactory results when applied to an untreated herd of horses.

Treatment was attempted with alternate injections of " Bayer 205 " and tartar emetic. 31·3 per cent. of cases were not again found positive after a full course of treatment had been given, but relapses occurred in 23·5 per cent. of cases, and local neck complications were frequently caused by the tartar emetic. The prophylactic use of " Bayer 205 " was adopted at first, but discarded as impractical. Tryparsamide was tried but failed to cure the infection and it is pointed out that a safe cheap drug is required for satisfactory treatment.

No immunity was transmitted by an infected animal to its offspring and animals cured by treatment could apparently be reinfected.

It is noted that the spread of the disease to the west of the Panama canal has only occurred recently and, with the opening up of roads, there is a danger of spread to the United States unless careful control is imposed.

During observation of an infected herd the following associated diseases were encountered :—piroplasmosis, 27·8 per cent. ; filariasis, 20·2 per cent. ; spirochaetosis, 4 cases ; strongylidosis, every animal examined. With regard to the last condition it was concluded that a great many animals live a long life with few periods of serious interference, but that accidents due to it do occur. Embolic colic appeared to be rare.—U. F. Richardson.

Bennett, S. C. J. (1934). **Control of Camel Trypanosomiasis.**—*Ann. Rep. Sudan Vet. Serv. 1933.* pp. 23. [fcp] [mimeographed].

The routine method of control is diagnosis by means of the mercuric chloride test and treatment of positive reactors with a single intravenous dose of 4 g. of " naganol." During the past three years over 4,200 infected camels have been so treated and only one failure has been recorded. [Between drafting and publication of the Report, a second undoubted failure has been reported]. It is pointed out that of the 4,000 odd treatments only about 1,000 were in officially owned camels whose subsequent history is available for reference.

The term " failure to cure " means a case in which the camel lived sufficiently long after treatment for a veterinary officer to be sure that all the trypanosomes had not been killed, either by recording a persistent positive mercuric chloride reaction or by again seeing trypanosomes in the blood. Camels that had been given " naganol " when nearly dead, and treated camels recorded from non-veterinary sources as having subsequently died of trypanosomiasis are not recorded.

The present routine curative dose of 4 g. is being retained.

—S. C. J. Bennett.

Giraud, P., & Cabassu, H. (1933). Le chien est-il le réservoir de virus de la leishmaniose interne. [**Is the Dog a Reservoir of K.A. ?**]—*Arch. Méd. Gén. et Colon.* **2.** 23-27. [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 229. Signed C. M. W.]

Owing to the frequent occurrence of leishmania in the skin of dogs suffering from kala azar in and around Marseilles the authors are led to suggest that this is due to the repeated wounding of the skin by ticks infected with leishmania. Similarly they think that the dermal infections seen in some human cases in India may also be due to repeated skin inoculations by infected insects. As regards the Mediterranean disease they believe that the banishing of dogs from the neighbourhood of children and the careful destruction of ticks which they have left behind in the gardens will at least check the disturbing extension of the human disease which has taken place. Unfortunately, no experimental evidence is produced to prove that the dog tick is capable of spreading the infection.

PIERI, J., & LENA, D. (1933). Leishmaniose infantile. Sur un cas observé en Corse. [**Case of Infantile K.A. in Corsica**].—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 49th Year. 3rd. Ser. No. 30. 1402-1404. [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 235. Signed C. M. W.]

The record of a case of kala azar in a child three years old from Calvi in Corsica. It is also noted that of 16 dogs from Bastia and its environs examined by M. Ch. JOYEUX one was found to show leishmania in the spleen and bone marrow.

NELSON, E. C. (1933). **The Feeding Reactions of *Balantidium coli* from the Chimpanzee and Pig.**—*Amer. J. Hyg.* **18.** 185-201. 1 text fig., 5 figs. on 1 plate. [20 refs.] [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 288. Signed C. M. Wenyon].

With cultures of *Balantidium coli* from the chimpanzee and pig tests were made with a number of substances to discover what was most actively ingested. It was found that the ciliates took in and digested starch most readily and after it red blood corpuscles. This observation is in agreement with the claims that infections with the ciliate can be eradicated by reducing the starch of the diet and that rats are more readily infected experimentally when on a diet rich in carbohydrate.

RATCLIFFE, H. L. (1934). **Intestinal Lesions associated with Amebic and Balantidial Infection in Man and Lower Animals.**—*Amer. J. Hyg.* **19.** 68-85. 15 figs. [22 refs.] [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 287. Signed C. M. WENYON].

A study of invasion of the intestinal wall by balantidia in the capybara and by amoebae in swine suffering from hog cholera has shown the author that in both cases this is preceded by lesions of the surface initiated by some cytotoxic or necrosing substance elaborated by the protozoa. There was no evidence that the ciliates or amoebae advanced in the tissues before necrosis had occurred.

The extension of the tissue necrosis may be due in part at least to bacteria which invade the primary necrotic areas. Direct extension of the necrotic area may give rise to deep ulcers which, however, may also be formed by rupture of bacterial abscesses of the lymph follicles. By the examination of intestines at varying intervals after death of the host it has been determined that post-mortem penetration will account for organisms isolated or in groups deep in the intestinal wall. The ciliates are able to invade cut edges of the large intestine at autopsy.

NEITZ, W. O. (1933). **Blood Parasites of Game in Zululand. Further Report.**—*Onderstepoort J. Vet. Sci. & Anim. Indust.* **1.** 411-417. 4 figs., 4 tables. [1 ref.]

In the examination of a large number of blood smears from game taken in the Lower Umfolozi District of Zululand, *Trypanosoma vivax* was found in two bushbuck and one kudu. Parasites resembling *Nuttallia equi* were found in a zebra, but only one parasite per erythrocyte was seen. Small piroplasms of the *Theileria mutans* type were seen in seven bushbuck, two kudu and seven waterbuck. Microfilaria were found in bushbuck, waterbuck and warthogs. In one bushbuck *Th. tragelaphi* was seen with Koch's bodies in a lymph gland smear.

—E. M. Robinson.

DISEASES CAUSED BY VIRUSES.

Kind, G. G. (1933). **The Effect of Light on the Immunizing Properties of Formolized Horsesickness Virus.**—*J. S. Afric. Vet. Med. Ass.* **4.** 202-205. 5 tables. [2 refs.]

The author considers that light has a marked effect upon the formolized vaccine for horse-sickness. He found that the vaccine prepared in the daylight and kept in colourless glass bottles deteriorated whereas, if kept in brown bottles and prepared at night, it maintained its properties better. In view of the irregular and rather unsatisfactory results obtained by the use of formolized virus in the immunization of horses against horse-sickness, Kind's observation, if confirmed, may be of great significance. In view of the success of the method of immunization with mouse brain, it is very likely that the formolized virus method will not be very widely used in future.—E. M. Robinson.

Haddow, J. R., Sen, K. C., & Roy, A. C. (1933). **On the Fractional Precipitation of the Antibody Containing Protein of Anti-Rinderpest Serum : Part I, Preliminary Communication.**—*Ind. J. Vet. Sci. & Anim. Husb.* **3.** 149-159. 3 tables. [38 refs.]

Topacio, T. (1933). **The Electric Charge of Rinderpest Virus.**—*Philippine J. Sci.* **51.** 637-644. 1 fig., 3 tables. [5 refs.]

The first paper records experiments to ascertain whether the protein fraction of anti-rinderpest serum, which contains the protective antibodies, can be separated by the water precipitation method and what is the relative efficiency of this method compared with the precipitation of the euglobulin or the total globulin by ammonium sulphate.

The water-insoluble protein was obtained by pouring 160 c.c. of serum into 1,440 c.c. of distilled water containing sufficient phosphoric acid to bring the pH to the value required (6·4 to 6·8). The precipitate was allowed to sediment and dissolved in normal saline corrected to pH 7·6. The number of tests was too limited to give conclusive results, but appeared to indicate that the antibody content of the water-precipitated protein was as high as that of the euglobulin fraction precipitated with ammonium sulphate. Attempts made to concentrate the antibody were not entirely satisfactory but gave encouraging results.

The second paper records experiments undertaken to ascertain the electric charge of rinderpest virus. Virus suspensions were prepared from the mesenteric glands of an animal at the height of the disease and Sorensen's phosphate buffer was added to provide vials of the suspension at pH 5·2, 7·2 and 8·2. Blotting paper which carries a negative charge was cut into strips, marked off into areas of 1 sq. cm. and hung from wire into the vials of the virus suspension in an incubator ; segments were cut out and tested for virus content by inoculation into susceptible animals. Three parallel experiments were carried out. The blotting paper segments

from vials at pH 5·2 failed to infect, indicating that, at this reaction, the virus carried a positive charge which enabled the paper to arrest the virus particles. At the other reactions, the results indicated that at pH 7·2 the virus particles carry a negative charge, whilst at pH 6·2 they may be either negatively or positively charged.

—U. F. RICHARDSON.

DE BLIECK, L., & JANSEN, J. (1933). Bestaat er wederkeerige immuniteit tusschen pokken en mond- en klauwzeer? [**Is there a Mutual Immunity between Cow Pox and Foot and Mouth Disease?**]—*Tijdschr. Diergeneesk.* **60.** 769-780. [35 refs.] [English, French and German summaries: abst. from orig.]

The authors discuss the literature concerning mutual immunity between the viruses of cow pox and foot and mouth disease, report on a number of experiments carried out on guinea pigs and conclude that no such cross-immunity occurs. Five guinea pigs, immune to cow pox, were infected with foot and mouth disease virus (type O) and developed generalized lesions. Twenty-four guinea pigs recovered from foot and mouth disease (type O) were susceptible to cow pox virus when inoculated after 14, 27, 34, 36 days and four and a half months respectively. Three guinea pigs that had recovered from generalized foot and mouth disease (type A) 13 and 20 days previously and seven guinea pigs that had recovered from an infection with the C type of virus 12, 21 and 34 days previously, were susceptible to cow pox.—J. VAN DER HOEDEN (UTRECHT).

I. REMLINGER, P., & BAILLY, J. (1933). Sur le comportement du virus de la maladie d'Aujeszky dans le cerveau de la Tortue. [**The Effect of the Virus of Aujeszky's Disease on the Brain of the Tortoise**].—*C. R. Soc. Biol. Paris.* **114.** 889-890. [2 refs.]

II. REMLINGER, P., & BAILLY, J. (1933). Transmission de la maladie d'Aujeszky au chacal (*Canis anthus* L.) et à l'épervier (*Astur nisus* L.). [**Transmission of Aujeszky's Disease to the Jackal and the Sparrow-Hawk**].—*Bull. Acad. vét. France.* **6.** 444-448. [3 refs.] [Reported *verbatim* in *Maroc-Méd.* Dec. 15th. 577-579. [3 refs.]

III. TRAUB, E. (1933). **Cultivation of Pseudorabies Virus.**—*J. Exp. Med.* **58.** 663-681. 3 figs. on 1 plate, 7 tables. [21 refs.]

I. The intracerebral inoculation of the virus of Aujeszky's disease produces no visible effect upon the tortoise. The virus can, however, be recovered from the brain for a period of 35 days. This is regarded as a simple passive conservation of the virus.

II. The virus of Aujeszky's disease was transmitted to the jackal by intracerebral and intra-ocular inoculation, but all attempts at producing the disease by feeding were abortive (the dog can be infected by this route). The sparrow-hawk was also infected by the intracerebral route. The virus was demonstrated both in the brain and in the blood.

III. The Hungarian strain of the virus of Aujeszky's disease was successfully grown in tissue media. The cultures were initiated with 0·3 c.c. of a 10 per cent. emulsion of infected rabbit brain suspended in 2·0 c.c. of Tyrode's solution and 2·0 c.c. of rabbit serum containing 100 to 150 mg. of minced rabbit testicle. As is the case with vaccinia [RIVERS & WARD, this *Bull.* **3.** 544.] excessive amounts of tissue inhibited the growth of the virus; moreover, it was noted that growth depended upon the relationship between the amounts of rabbit testicle and inoculum respectively, i.e., the smaller the quantity of inoculum, the greater the amount of tissue which was required. Rabbit serum was found to be essential.

The cultures were incubated at 37°C. for two days and the virus content estimated by the subcutaneous or intraperitoneal injection of mice. The strain was carried through 49 serial passages.—R. E. GLOVER.

KÖBE, K. (1933). Die Aetiologie der Ferkelgrippe (enzootische Pneumonie des Ferkels). [**The Aetiology of Swine Influenza (Enzootic Pneumonia of Young Pigs)**].—*Zlb. Bakt. I. (Orig.).* **129.** 161-176. 5 figs., 4 tables. [28 refs.]

Sixty-nine spontaneously infected cases of enzootic pneumonia in young pigs have been studied. In piglets three to four weeks old the condition is associated with inactivity and loss of appetite; in slightly older animals a cough is characteristic. At autopsy a catarrhal pneumonia is found with areas of hepatization. The bronchial lymphatic glands are markedly swollen. There is catarrh of the large and small intestine and swelling of the associated glands ; no other changes are noticeable. Histologically, broncho-pneumonic changes with desquammation of the epithelium are found.

A Gram-negative bacterium, having the main characteristics of the *Haemophilus* group, was generally, but not invariably, isolated from infected cases. The cultural characteristics, pathogenicity and serology of the organism are described in detail. Intranasal injection of pure cultures failed to promote infection, but injection of extracts of diseased tissue produced typical symptoms. The injection of cell-free filtrates of diseased tissue produced only a very mild disorder. It is shown that the disease is spread by contact.

Like the North American swine influenza, described by SHOPE and LEWIS [this *Bull.* **2.** 84 and **3.** 301.], it is thought that the typical disease is produced by the combined effect of a filtrable virus and a *Haemophilus*-like bacterium.

—E. J. PULLINGER.

I. SEDLMEIER, H. (1933). Histologische Veränderungen des Zentralnervensystems bei Schweine-Influenza. [**Histological Changes of the Nervous System in Swine Influenza**].—*Münch. tierärztl. Wschr.* **84.** 508-510. 3 figs., 1 table. [9 refs.]

II. WALDMANN, O. (1933). Die Aetiologie des Ferkelkümmerns. Die Ferkelgrippe. [**Influenza of Piglets**].—*Berl. tierärztl. Wschr.* **49.** 693-697. 2 figs. on 1 plate. [20 refs.]

III. SHOPE, R. E. (1934). **Swine Influenza. V. Studies on Contagion.**—*J. Exp. Med.* **59.** 201-211. 2 tables. [5 refs.]

I. The symptomatology, pathological changes and the aetiology of the disease are given brief mention [these points are discussed in greater detail by KÖBE, K. (1933). this *Bull.* **4.** 573]. Experimental cases were produced by contact, and also by intranasal injection of diseased tissue extracts and by intravenous injection of cell-free filtrates together with the specific *Haemophilus*-like bacterium. Five cases produced in this manner were examined at autopsy. Lobar and lobular catarrhal pneumonia with atelectasis and oedematous enlargement of the lymphatic glands were found. The brain and central nervous system showed no macroscopic changes. Microscopically in two out of five cases there was marked cellular infiltration of the brain tissue with the formation of cell mantles around the capillaries. The infiltrative cells were chiefly lymphocytes and polyblasts. Polymorphonuclear leucocytes were rare. Multiple foci of congestion and haemorrhage were also found. Cell or nuclear inclusion bodies were not seen.

II. Disease of the influenza type is common amongst piglets in Germany, the outstanding symptoms being inappetence and a chronic cough. Numerous

names have been given to the condition and numerous bacteria, including *Bact. suipestifer* and *Past. suiseptica*, have been described as the causal organisms. The author states that a proportion of these cases is really chronic swine fever. A distinct disease has also been shown to exist which is caused by the combined action of a virus and a bacillus having the characteristics of the *Haemophilus* group. The macroscopic and microscopic changes associated with acute and chronic swine fever are summarized. A résumé is given of the work of SHOPE and LEWIS on swine influenza of America [this *Bull.* **2.** 84 and **3.** 301.] as well as a brief description of the disease as it occurs in Germany. Waldmann says, however, that the American and German conditions are separate entities. A useful list of references is included.

III. In the course of maintaining the infection of swine influenza, an attempt was made to transfer the infection by contact instead of by the usual intranasal inoculation of virus plus *Haemophilus suis* culture. In place of typical swine influenza a mild disease resembling the " pure filtrate disease " occurred, whilst *H. suis* could not be isolated from infected cases. Animals passing through this mild form of disease were solidly immune to subsequent artificial infection with virus plus *H. suis*. Apparently between March and September, 1931 one or other of the components of the stock strain of infection underwent some change which altered the contagious character of the complete disease ; this change was found to be in the bacterial strain. Incidentally it was found that pure virus when given to susceptible carriers of *H. suis* produced typical swine influenza. Under natural conditions, therefore, it would be possible, at least in theory, to have the disease transferred in three different ways, viz.:–(1) virus plus *H. suis* producing typical swine influenza ; (2) virus alone to an animal not a carrier of *H. suis*, producing a mild disease and (3) virus alone to a carrier of *H. suis* producing the typical disease.—E. J. PULLINGER.

I. CARPANO, M. (1933). **Fowl-Plague in Egypt. Fowl-Disease or Fowl-Plague of Newcastle, Egyptian Pseudo Fowl-Plague.**—*Min. Agric. Egypt. Tech. & Sci. Serv. Vet. Section. Bull.* No. 129. pp. 20. 7 figs. on 6 plates, 4 tables. [13 refs.]

II. BURNET, F. M., & FERRY, J. D. (1934). **The Differentiation of the Viruses of Fowl Plague and Newcastle Disease : Experiments using the Technique of Chorio-Allantoic Membrane Inoculation of the Developing Egg.**—*Brit. J. Exp. Path.* **15.** 56-64. 4 figs. on 1 plate, 3 tables. [14 refs.]

III. PLOTZ, H. (1934). Identité du " virus de culture " et du " virus de sang " de la peste aviaire. [**Identity of Culture Virus and the Natural Virus in Fowl Plague**].—*C. R. Soc. Biol. Paris.* **115.** 357. [2 refs.]

I. Carpano describes in detail the epidemiology, clinical syndrome and lesions of fowl plague in Egypt. He concludes that the virus disease of fowls endemic in Egypt is the classical fowl plague. He is strongly of the opinion as the result of his observations on naturally occurring outbreaks, and on the artificially induced infection, that Newcastle disease does not occur in Egypt.

Carpano has always failed to set up infection in pigeons with the Egyptian virus. [Pigeons are susceptible to infection with the Newcastle virus, but are resistant to fowl plague virus].

He refers to the strain of virus reported by LAGRANGE in Egypt [(1929). *Bull. Soc. Path. exot.* **22.** 64.] under the title " Egyptian Pseudo-Plague " and accepts with great reserve the conclusions of that observer.

[PURCHASE–this *Bull.* **1.** 133.–who studied the Egyptian pseudo-plague virus isolated by LAGRANGE concluded that it was an atypical strain of fowl plague virus].

II. Burnet and Ferry made a comparative study of the viruses of fowl plague and Newcastle disease, the technique employed being the inoculation of the chorio-allantoic membrane of the developing egg, having found this method to be of considerable value for the investigation of certain aspects of the acute virus infections of fowls.

The investigation comprised a study of (1) the gross and microscopic changes in infected eggs ; (2) the size of the virus particles as judged by differential membrane filtration experiments and (3) the resistance of the viruses to photodynamic inactivation by methylene blue.

Sections of the chorio-allantoic membrane of eggs inoculated with Newcastle virus showed the principal lesion to be a patchy ectodermal proliferation followed by, or associated with, gross vacuolation of the epithelial cells and eventual necrosis. In some areas the vacuoles contained sharply defined acidophile bodies which appeared to be true cytoplasmic inclusions. In fowl plague the membrane showed almost complete absence of ectodermal cells. No inclusion bodies were observed.

Filtration studies with egg material indicated that Newcastle disease virus was larger (80 to 120 $m\mu$) than fowl plague virus (60 to 90 $m\mu$). The Newcastle virus was found to be more resistant to photodynamic inactivation by methylene-blue than fowl plague.

" These differences in conjunction with the known clinical and immunological differences point to the complete aetiological independence of the two diseases."

III. Plotz records that the virus of fowl plague is still highly virulent after 72 subcultures in a tissue culture medium [this *Bull.* **4.** 238.] and that a dose of 10^{-6} c.c. killed a fowl in 48 to 72 hours.

Immunity experiments demonstrated that the antigenic value of the " culture virus " was similar to that of the natural virus. Serum-virus neutralization experiments failed to show any difference in the antigenic properties of the two viruses.

—T. M. Doyle.

I. Stubbs, E. L. (1933). **The Relation of Age, Breed, and Species to Susceptibility to Transmissible Leucosis of Chickens.**—*J. Amer. Vet. Med. Ass.* **82.** 232-242. 4 tables. [8 refs.]

II. Forestier, A. C. (1933). La leucémie transmissible des Poules. [**Transmissible Leucaemia of Fowls**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 61. [33 refs.]

I. The author investigated the susceptibility of fowls of various ages to transmissible leucosis. Blood was used as the infecting agent and birds varying in age from four days to over three years were inoculated intravenously. Blood smears were collected weekly and the blood changes recorded. The conclusions drawn are that the condition can be transmitted to chickens of all ages, and that the susceptibility is greater in younger birds. Unfortunately an experiment covering only six birds per breed does not suggest any variation in the susceptibility of the birds of various breeds to this artificial infection.

Experiments show that the condition cannot be transmitted by the inoculation of leucotic blood of chickens into birds of other species.

II. The author gives details of the composition of the blood of normal fowls and the part played by various blood-forming tissues.

Two types of leucaemia are distinguished in the fowl, myeloid and lymphoid. The symptoms of the myeloid type, which is stated to be of more frequent occurrence, are weakness and anaemia shown by several birds in a flock. Examination of the blood shows a large increase in the number of the white blood corpuscles and immature erythroblasts and erythrocytes.

There are no constant symptoms of lymphoid leucaemia and the blood picture is generally normal. Besides the change in the blood picture in the myeloid type, *post-mortem* examination shows an increase in the size of the liver and spleen with the presence of myeloblasts in the venous sinuses of the bone-marrow and in the capillaries of the spleen and liver.

In lymphoid leucaemia the increase in the size of the liver and spleen is not constant, but the spleen and liver show white nodules. Lymphoblasts are noted in the infiltrations in the liver, spleen and other tissues. No treatment of value has yet been found.

The aetiology is not fully known, but the author is in agreement with the hypothesis that the cause is a filtrable virus and that the condition is transmissible.

—NORMAN DOBSON.

INVERTEBRATE VECTORS OF DISEASE.

PARROT, L., DONATIEN, A., & LESTOQUARD, F. (1933). Notes et réflexions sur la biologie de *Phlebotomus perniciosus* Newstead en Algérie. [**Biology of** *P. perniciosus* **in Algeria**].—*Arch. Inst. Pasteur d'Algérie.* **11.** 183-191. 1 fig. [20 refs.] [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 229-230. Signed C. M. W.]

These notes refer to the distribution, incidence and habits of *Phlebotomus perniciosus* in Algeria, all of which afford arguments in favour of this sandfly being regarded as the vector of kala azar.

It has already been shown by the authors (1930) that it became infected with leptomonad flagellates after feeding on cases of canine kala azar. An interesting point regarding the larvae is that breeding experiments have shown that they develop quite well in the laboratory after hatching from eggs laid by captured females when given no other food than dry leaves of the tree *Ulmus campestris.* The development from the egg to the fly at a temperature of 22°C. to 24°C. occupies 134 to 216 days. This habit of the larvae of feeding satisfactorily on leaves agrees with the observation that the sandflies are associated with vegetation. NAPIER has stated that in Calcutta kala azar appears to be associated with the presence of vegetation which indicates a plant-feeding insect or vector.

LÖRINCZ, F., & SZENTKIRÁLYI, Z. (1933). Ueber das Vorkommen von *Phlebotomus macedonicus* (Adler und Theodor, 1931) in Ungarn. (Untersuchungen ueber Hunde-Kala-azar). [**Occurrence of** *P. macedonicus* **in Hungary**].—*Arch. f. Schiffs- u. Trop.-Hyg.* **37.** 458-464. 7 figs. [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 235. Signed C. M. W.]

The authors record the occurrence in Hungary of the sandfly named in the title. Though it has been suspected to be a vector of kala azar in Greece by ADLER & THEODOR the authors have not been able to obtain any evidence of the existence of human or canine leishmaniasis in their own country.

DISEASES CAUSED BY METAZOAN PARASITES.

I. —. (1933). **Screw-Worm Attacking Livestock in the Southeast for First Time.**—*Vet. Med.* **28.** 459-461.

II. CUSHING, E. C., & PATTON, W. S. (1933). **Studies on the Higher Diptera of Medical and Veterinary Importance.** *Cochliomyia americana* **sp. nov.,**

the Screw-Worm [Maggot] Fly of the New World.—*Ann. Trop. Med. & Parasitol.* **27.** 539-551. 7 figs. [3 refs.]

III. CUTHBERTSON, A. (1934). **Screw-Worm. A Pest of Ranch Cattle in Southern Rhodesia.**—*Rhodesia Agric. J.* **31.** 100-111. [1 ref.] [With a foreword by R. W. JACK].

I. A popular account is given of the maggot of *Chrysomyia* [*Cochliomyia*] *americana* which for the first time had been acting as an important pest in Georgia and Florida. The fly is found normally in these states, but not usually in such large numbers as to be of importance.

II. Cushing and Patton show that the adults of *C. americana* cannot be distinguished in the field from *C. macellaria* except by the female terminalia. This may be done by compressing the abdomen and extending the ovipositor which in *macellaria* is about one-third longer than that of *americana*. The writers consider that *C. americana* is the true "screw-worm" [maggot] fly of the New World and has in the past been mistaken for *C. macellaria* which they suggest is a harmless fly.

III. *C. bezziana* is recorded as the cause of myiasis in cattle, horses and dogs in Southern Rhodesia; it also occurs in sheep with other species of blow flies. All wounds predispose to attack by the screw-worm and the lesions caused by the Bont-legged tick (*Hyalomma aegyptium impressum* Koch) are particularly important in this respect.

The various methods of control are discussed; these include hand-dressing against ticks and the general prevention of wounds. The use of repellents and healing agents is also discussed and a preliminary experiment with vaccine therapy is credited with some favourable results.—J. S. STEWARD.

KRIJGSMAN, B. J., & WINDRED, G. L. (1933). **Investigations on the Buffalo Fly** *Lyperosia exigua* **de Meij.**—*Council Sci. & Indust. Res. Australia. Pamph.* No. 43. pp. 40. 7 figs., 7 tables. [46 refs.]

Experiments were carried out on the reactions of *L. exigua* to various stimuli. It was shown that the fly is attracted to light, that it moves against air currents, that it prefers rough surfaces to walk on, that it shows a marked preference for a certain degree of warmth and that it moves towards water. It was also demonstrated that the fly could detect the smell of various animals over a distance, but that it preferred the odour of cattle to that of other animals. There was no preference for any particular host colour.

The following results were obtained from a study of the relation between *L. exigua* adults and mammalian faeces :—

(1) It reacts to the presence of dung of herbivora (horse, cow, buffalo) with a positive tactic movement, extension of the proboscis, piercing and sucking. (2) It can distinguish between different kinds of dung, preferring buffalo dung first, then cow dung and finally horse dung. The faeces of the dog have no attraction for the fly. (3) As the dung becomes older, its stimuli decrease and the attraction to old dung is probably caused by the water content. (4) The positive taxis is chiefly evoked by a specific dung smell. The group of amines plays a big role in that smell. (5) The faeces of herbivora have a much stronger attraction for the females than for the males, although both are attracted. (6) The oviposition reaction, as in (1), and also the extension of the ovipositor and extrusion of eggs, are not only shown on dung, but sometimes in very different circumstances. Therefore, the reaction must be principally in answer to internal stimuli. The presence of dung, however, very probably has a stimulating action.

Experiments were carried out with a view to discovering what food the larvae

of *L. exigua* actually preferred. It was found that they prefer fresh buffalo dung, but are able to survive in dung five days old. They can go through their cycle in the excrement of buffaloes, cows, horses, pigs, rabbits, guinea pigs and wallabies. Vegetable matter in all states of decomposition was unsuitable for the development of the larvae. Experiments with four species of bacteria also gave negative results.

In this work it is considered most improbable that *L. exigua* could ever become established in any area where there were no cattle or buffaloes and, although it has not been observed to feed on pigs, the fact that the larvae can flourish on pigs' dung in its normal state would suggest that the fly might possibly gain a hold in areas where pigs occur.

Field observations demonstrated that there is a close correlation between the abundance of *L. exigua* and the rainfall. Swampy conditions, if the rainfall is not excessive, favour the development of the fly.

The larval stage is the most easily influenced by climatic conditions and especially by rainfall. The larvae show a marked preference for a degree of moisture in dung similar to that of the freshly dropped faeces. When nearing pupation, a drier milieu is preferred.

In very wet dung the larval period is prolonged and many larvae die if a drier situation cannot be found for pupation.

With artificial rainfall, it was found that the number of puparia formed increased inversely as the rainfall, provided that evaporation was not too great.

The low incidence of *L. exigua* in Java is determined, primarily, by the high rainfall over the greater part of the island, rendering the dung unfavourable for the development of the larvae.—H. McL. Gordon.

Babic, I. (1933). Parazitički crvi ustanovljeni kod zivotinja naročito domaćih u Jugoslaviji. [**Parasitic Worms in Animals, Especially Domestic Animals, in Yugoslavia**].—*Vet. Arhiv.* **3.** 100-107. [8 refs.] [Abst. from English summary].

This is a check list of parasitic worms of domestic and other animals in Yugoslavia, for which the original must be seen.—J. E.

I. Gogolka, K. H. (1933). Ueber den Befall und die Behandlung von Sklerostomenpferden. [**Treatment of Equine Sclerostomiasis**].—*Inaug. Diss. Berlin.* [43 refs.] [Reported *verbatim* in *Zschr. Veterinark.* **45.** 384-392. 1 table, 4 graphs.]

II. Seehawr. (1933). Ueber die Bekämpfung der Sklerostomiasis der Pferde. [**Control of Equine Sclerostomiasis**].—*Zschr. Veterinark.* **45.** 406-422. 3 tables. [14 refs.]

III. Albrecht, A. (1933). Neuere Forschungsergebnisse und Beobachtungen bei der Sklerostomiasis der Pferde. [**New Knowledge on Equine Sclerostomiasis**].—*Deuts. tierärztl. Wschr.* **41.** 604-606. [22 refs.]

I. Gogolka considers that sclerostomiasis has not received the attention it deserves and that it is associated with colic. He examined the faeces of 207 horses for worms' eggs morning, mid-day and evening for three days and tabulated the results. The faeces of newly born animals were free from eggs. Infection seems to be acquired by the end of the first year. Clinical symptoms appear in two-year-olds and after three years of age the number of worm eggs gradually falls. The time of day and season of the year have little influence on the number of eggs in the faeces, but country horses have higher counts than housed ones.

A combined treatment gave satisfactory results. After fasting, carbon tetrachloride was given with a stomach tube on the first day, 1·5 g. of antimony-potassio-

tartrate in 50 c.c. of distilled water was injected intravenously into the jugular vein on the second day, and 4 g. was given *per os* on the third day. The intravenous injection of " neosalvarsan " brought about a greater reduction in the egg count.

II. This is an account of an extensive research into the value of certain equine anthelmintics. After a general discussion on previous work and pathological changes, the author deals with the proprietary preparations " antimosan," " stibosan," antimony solutions III and V, and then carbon tetrachloride and tetrachlorethylene. In all, 30 animals, which the author describes as foals, were used. Intravenous preparations were also directed against the larval forms in the arteries and other situations away from the bowel lumen. The weight of each animal was recorded, at the beginning, at the end and after six weeks of the treatment, and the increase or decrease during the latter period noted. The number of worms' eggs in the faeces was similarly tabulated. It is difficult to do justice to the article in a short abstract, but the author comes to the following conclusions :—(1) the antimony preparations used in the experiments were not superior to antimony-potassio-tartrate and have no practical place in the control of sclerostomiasis ; (2) carbon tetrachloride was satisfactory for the treatment of the disease, especially when combined with antimony-potassio-tartrate ; (3) tetrachlorethylene was satisfactory treatment for ascarids and bots, but not for sclerostomes ; (4) the administration of carbon tetrachloride with a stomach tube is simple and free from danger and (5) poisonous effects or disturbances in health were not seen.

III. This review deals with some of the aspects of sclerostomiasis. In the introductory portion, chief reference is made to the synonymy and bionomics of the three large palisade worms *Strongylus equinus*, *S. vulgaris* and *S. edentatus*. It is stated definitely that invasion usually takes place by penetration of the skin of the coronet and through the oral mucous membrane, chiefly during the night and in the early hours of the morning, in fields. There is a short account of the differentiation of the species by means of the larvae and descriptions of diagnostic tests with antigen instilled on the conjunctiva of the lower lid and under the skin. There is a brief account of the symptomatology and prevention. Numerous anthelmintics with the names of authors who used them are considered. Among these may be mentioned " atoxyl," " plasmarsin," " rivonal," " sklerostomex " (a copper preparation given intravenously), oil of chenopodium, " santonin," carbon tetrachloride, antimony-potassio-tartrate and " Cerjodyl " (Atarost) (a proprietary preparation of arsenic, iodine, etc.).—A. W. N. Pillers.

IMMUNITY.

I. Poelma, L. J., Everson, C. L., Brueckner, A. L., & Pickens, E. M. (1933). **A Study of the Brucella abortus Agglutination Titres of the Various Species of Farm Animals in Maryland.**—*Cornell Vet.* **23.** 344-347. 2 tables. [11 refs.]

II. Dubois, C., Doutre, E., & Hugon, P. (1933). Dépistage de la brucellose chez les Bovidés de boucherie par la recherche des réactions d'allergie. [**The Value of the Intradermal Test for the Diagnosis of Contagious Abortion**]. —*C. R. Soc. Biol. Paris.* **114.** 1273-1274. [1 ref.]

III. Dubois, C. (1933). Au sujet de la " réactivation " du séro-diagnostic de Wright chez les Ovins et les Bovins atteints de brucellose. [**The Resuscitation of the Agglutinins in Sheep and Cattle Infected with Brucella**].—*Ibid.* 1275-1277.

IV. COURMONT, P., & BILLA, M. (1933). De l'agglutination des microbes de la fièvre ondulante par le sérum des tuberculeux. [**The Agglutination of** *Br. melitensis* **by the Sera of Tuberculous Persons**].—*Bull. Soc. Sci. vét. Lyon.* **36.** 158-160.

I. Poelma and his co-workers carried out a survey based on the agglutination test, for the presence of brucella infection among horses, mules, pigs, sheep, goats, dogs, cats and fowls in Maryland. Complete agglutination in a dilution of 1 : 100 was accepted as indicating infection. 10 per cent. of horses, 12 per cent. of mules and 1·3 per cent. of pigs gave positive reactions. No positive reactions occurred among the other species tested.

II. The authors tested on 141 bovines the diagnostic value for contagious abortion of a killed suspension of *Br. abortus* injected intradermally into the caudal fold. Agglutination tests were made with the blood sera to control the results obtained in the intradermal test. Twenty-six animals gave positive reactions to the intradermal test, nine were positive to the agglutination test (1 : 50) and eight were positive to both tests. The authors conclude on these data that the intradermal test is a sensitive and practical method for the diagnosis of contagious abortion.

III. Dubois tested on sheep and cattle the diagnostic value for brucellosis of an intradermal injection of a killed suspension of *Br. abortus*. An agglutination test was made of the blood serum of each animal as a control to the intradermal test. The intradermal test gave a higher number of positives than the agglutination test.

IV. In view of the observations of SEGA that the sera of persons affected with tuberculosis give a high agglutination titre with *Br. melitensis* antigen, Courmont and Billa tested the sera of 14 persons affected with tuberculosis, against *Br. abortus* and *Br. melitensis* antigens. Thirteen sera gave results and one serum, from a man known to have had undulant fever some years previously, reacted in a 1 : 50 and a 1 : 10 dilution with *Br. melitensis* and *Br. abortus* antigens respectively.

—T. M. DOYLE.

JEZIC, J., & KODRNJA, E. (1933). Prilog poznavanju pouzdanosti Ascolijeve reakcije za diagnozu antraksa. [**The Reliability of the Ascoli Test for Anthrax**].—*Vet. Arhiv.* **3.** 212-236. 4 tables. [91 refs.] [Abst. from German summary].

The Ascoli test was applied to three groups of animals :—(1) rabbits, sheep and one horse, which had survived vaccination and artificial infection ; (2) rabbits, sheep and horses, which survived vaccination, but died on subsequent artificial infection and (3) rabbits and one sheep which died after vaccination.

From the total of 113 animals, 417 Ascoli tests were carried out, with material from the tip of the ear, the base of the ear, the skin at the site of inoculation or the spleen or liver. It was found that the Ascoli test was negative in actively immunized animals 12 or more days after vaccination, but was positive in animals dying as a result of vaccination, or in vaccinated animals dying at a subsequent infection.

The spleen or liver were found to be the most reliable tissues for use with the Ascoli test. The skin is less useful, and the ear still less. The efficiency of the test with spleen or liver of animals dead from anthrax is given as 94·7 per cent.—J. E.

DISEASES, GENERAL.

LESLIE, A. (1934). **The Relation between Faulty Winter Feeding of Ewes and the Susceptibility of their Lambs to Pulpy Kidney.**—*New Zealand J. Agric.* **48.** 197-204. 1 table. [12 refs.]

The author disagrees with other workers on the primary cause of deaths in lambs from pulpy kidney disease. He agrees that the finding of *B. ovitoxicus* [*Clostridium ovitoxicum*] is a distinct advance, but he believes that the death rate of lambs three to six weeks old has a basal reason similar to the mortality in lambs at birth and up to three days of age. That reason is the malnutrition of the foetus *in utero*. His work is carried out on poor country in Canterbury whereas other observers have worked on richer types of pasture. It is stated, without evidence, that there is a lowered milk yield of the dam in many cases of the disease. Some attention has been paid to the sex rates of dead lambs from birth to " pulpy kidney age " and it is said that while lambs dying at birth are predominantly male, two male to one female, those dying from pulpy kidney disease are often predominantly female.

In a few cases of pulpy kidney disease seen by Leslie the lambs were of the backward under-developed type : this is contrary to the experience of others who have found that the fastest growing lambs are usually attacked.

He concludes by saying that it is noteworthy that rapid decay of teeth in breeding ewes is common, that breeding efficiency is low and that natural growth meets the food requirements of the flock for about four months of the year only in those flocks under experiment.

The article gives detailed reports on six cases of pulpy kidney disease.

—C. S. M. HOPKIRK.

HOPKIRK, C. S. M. (1934). **Pink-Eye in Sheep.**—*New Zealand J. Agric.* **48.** 224-225.

A short notice for sheep breeders concerning the prevalence and treatment of this contagious ophthalmia.

Research work had not yielded any organism which could be held responsible for the infectivity of the disease.—C. S. M. HOPKIRK.

RIGG, T., & ASKEW, H. O. (1934). **Sheep-Ailment in the Westhaven-Cape Farewell District, Collingwood County, Nelson.**—*New Zealand J. Sci. & Technol.* **15.** 258-262. 3 tables.

ASKEW, H. O., & RIGG, T. (1934). **Sheep-Sickness in the Pakawau District of the Collingwood County, Nelson.**—*Ibid.* 305-308. 2 tables.

The authors of these papers are chemists and are interested in the diseases of sheep from pasture and soil deficiencies. Sheep lose condition and tend to become anaemic when kept on the areas under investigation.

An analysis of soils shows a lime deficiency with a shortage of phosphoric acid in some districts.

Pasture shows a somewhat low phosphoric acid content with occasional deficiency in lime as well. Sheep improve on bone meal licks, although in some cases they refuse the salt ; in this case " moose nuts," etc., have to be added to the bone meal.—C. S. M. HOPKIRK.

CORKILL, T. F. (1934). **Toxaemias of Pregnancy.**—*New Zealand Med. J.* **33.** No. 174. (Obstetrical Soc. Section, pp. 9-20). 1 fig. [14 refs.]

This article on the human subject is of general interest to veterinarians in that it correlates the modern view. The chief point of interest is that the medical profession now realize that liver impairment is the chief cause of eclampsia and that renal upset, where present, is a secondary feature. [This is borne out in ante-partum paralysis of sheep which might be looked upon as one of the most characteristic eclamptic conditions of animals].

—C. S. M. Hopkirk.

I. Roderick, L. M., Harshfield, G. S., & Merchant, W. R. (1933). **Further Observations on the Functional Pathology of Pregnancy Disease of Ewes.** —*Cornell Vet.* **23.** 348-353. 2 tables. [11 refs.]

II. Leslie, A. (1934). **Some Factors Associated with Milk Fever of Ewes in Canterbury, New Zealand.**—*Vet. Rec.* **14.** 239-240. [5 refs.]

I. Eight cases were examined together with six normal pregnant ewes. The liver fat was increased greatly, there being an average content of 60 per cent., as compared with 7·2 per cent. in the normal. The liver glycogen in the affected ewes averaged 0·7 per cent. ; in the controls it was 12·8 per cent. These figures are on the dry basis. The blood glucose varied widely, but tended to be lower in the affected animals than in the controls although there was considerable overlapping. There was a serious impairment of liver function as measured by the ability to remove rose bengal from the blood, but there was no excess of cholesterol or amino-acids in the blood.

II. The milk fever occurs as early as 14 days before lambing, or may occur during lambing or some weeks later. The greatest incidence was 12 per cent. in a flock of 450. Young ewes are not susceptible and the old ewes which are attacked are not necessarily good milkers. It has been noted in Canterbury that dry ewes, poor producers and inadequately fed in-lamb ewes may develop acute hypocalcaemia. When these receive an intensive diet rich in protein the crisis is precipitated and they develop milk fever. The basis on which the diagnosis was made is not stated.—Henry Dryerre.

PUBLIC HEALTH.

Pullinger, E. J. (1934). **The Incidence of Tubercle Bacilli and Brucella abortus in Milk.**—*Lancet.* **226.** 967-971. 5 tables. [24 refs.]

This article describes the bacteriological examination of milk samples for *Br. abortus* and *Mycobact. tuberculosis.* A single guinea pig was used for each sample and an incubation period of six weeks was generally allowed.

Of 101 samples of certified, or Grade A (T.T.) milk one contained tubercle bacilli and 70 contained *Br. abortus.* The whole of 63 samples of milk taken from 3,000-gallon rail tanks contained tubercle bacilli and 53 of them contained *Br. abortus.* Duplicate samples from these rail tanks were free from these organisms after low temperature pasteurization.

105 samples of ungraded milk from Cheshire and 104 similar samples from Somerset were examined for contamination ; of the former, 22 contained tubercle bacilli and 39 contained *Br. abortus* and of the latter, 2 contained tubercle bacilli and 20 contained *Br. abortus.*

The technique of the guinea pig tests for this purpose is discussed and details of the author's precise method are given. In addition, the literature is briefly reviewed.—J. E.

DAHLBERG, A. C. **The Margin of Safety between the Thermal Death Point of the Tubercle Bacillus and the Thermal Cream Layer Volume Impairment in Pasteurizing Milk at Various Temperatures.**—*New York State Agric. Expt. Sta. Tech. Bull.* No. 203. pp. 10. [Copied *verbatim* from *Publ. Health Engineering Abstr. Washington.* 1933. **13.** Nov. 18th. Signed by C. T. BUTTERFIELD].

The data of North and Park on the thermal death points of the tubercle bacillus and the data of Marquardt and Dahlberg, and of Dahlberg on creaming, are compared. Correlation is shown to exist between the time and temperature required to kill the tubercle bacillus in milk. The same relationship holds for the maximum temperature milk can be exposed to for varying periods without altering creaming. Thus it was shown that 140° for 55 minutes, 142° for 30 minutes, 145° for 13 minutes, 155° for 1 minute, and 160° for 16 seconds yielded satisfactory results both in regard to killing T.B. and the absence of impaired creaming. The longer periods at the lower temperatures provided the greatest margin of safety but the longest period of 55 minutes is too long for commercial use. Margins of safety for each time-temperature relationship are given in tabular form.

BUNCE, E. H. (1933). **Comparative Notes on the Cryoscopy of Milk.**—*Ind. Med. Gaz.* **68.** 23-26. 6 tables. [1 ref.]

Cryoscopy, a term derived from two Greek words meaning the determination of the freezing-point, is now extensively used to ascertain if any water has been added to cows' milk. The freezing-point of a liquid is governed by the amount of dissolved material present, the greater the concentration the lower the freezing-point. The freezing-point of cows' milk has been found to be constant within definite limits. Thus added water, by diluting the concentration of solutes, will raise the freezing-point. While pure distilled water will freeze at 0°C., the freezing-point of cows' milk is –0·55°C. 0·55°C. is referred to as the freezing-point depression, e.g. if the freezing-point of cows' milk is found to be –0·275°C. it is assumed on the basis of work carried out that 50 per cent. of water has been added. The Hortvet apparatus is that used for the purpose.

Bunce found that while there was a wide range in variation in the fat and solids-not-fat in the milks of buffaloes, cows, goats and women, the depression of freezing-point was remarkably constant i.e. :–buffalo 0·56° to 0·59°C. ; cow 0·55° to 0·58°C. ; goat 0·55° to 0·59°C. and woman 0·55° to 0·59°C. The extraordinary similarity in the depression of freezing-point among the milks of the different species is to be noted.—R. G. LINTON.

ELSDON, G. D., & STUBBS, J. R. (1933). **The Freezing-Point of Pasteurised and Sterilised Milks.**—*Analyst.* **58.** 7-10. 2 tables. [1 ref.]

Some analysts are of the opinion that the processes of pasteurization and sterilization when applied to milk tend to reduce the freezing-point depression [see BUNCE above]. In order to throw light on this, the author conducted experiments to determine the freezing-point of milks " pasteurized " and " sterilized " at the depot of a milk-distributing firm in Manchester. The experiments showed that there is a slight tendency for the freezing-point depression to be decreased when milk is heated, but the author points out that the amount of change, when it does take place, is so small that it does not interfere with the value of the test when applied to milk which has been heated. As a check on their findings, the authors put some milk in a closed vessel and heated it in an autoclave for 30 minutes at about 230°F. Though the heated milk was brown in colour and had a strong flavour, the freezing-point depression had not been altered.—R. G. LINTON.

POISONS AND POISONING.

I. RIMINGTON, C., & STEYN, D. G. (1933). *Psilocaulon absimile* **N.E. Br. as a Stock Poison. I. Determination of Oxalic, Malic, Tartaric Acids, etc.**—*Onderstepoort J. Vet. Sci. & Anim. Indust.* **1.** 439-455. 2 tables. [45 refs.]

II. STEYN, D. G. (1933). **The Diagnosis, Treatment and Prevention of Vegetable Poisoning.**—*J. S. Afric. Vet. Med. Ass.* **4.** 193-201. 1 fig. [1 ref.]

I. In the course of his investigations into mortality among Angora goats in the Willowmore district of the Cape Province, Steyn strongly suspected a plant, *Psilocaulon* sp., of being the cause. The plant from the farm was toxic for rabbits, but when grown at Onderstepoort, where the soil conditions are very different, it was non-toxic. The plant contained considerable quantities of oxalic acid, with smaller amounts of malic and tartaric acids, as well as a toxic principle to be described in a later paper and to which the authors attributed the deaths of the goats in the field. The authors discuss the interrelations between the organic acids and their physiological function in plants and conclude with a discussion on the toxicology of oxalic acid and the oxalates.

II. This paper, by the author of "The Toxicology of Plants in South Africa" [see this *Bull.* **4.** 595.], discusses the subject in a practical way from the aspects of differential diagnosis, *post-mortem* findings, examination of organs, contents of alimentary tract, foodstuffs and pasture. The general principles of treatment and prevention are considered. A simple vest pocket modification of the picrate paper test for hydrocyanic acid is described, suitable for the rapid detection of cyanogenesis in plant material and useful, for example, in the diagnosis of one form of a disease of sheep locally named "geilsiekte."

—E. M. ROBINSON.

—. (1933). Plantas tóxicas del país. [**Poisonous Plants of the Country. (Argentine Republic)**].—*Rev. zootéc. Buenos Aires.* **20.** 54-58.

This paper gives data concerning poisonous plants examined by the botanical laboratory of the Ministry of Agriculture of the Argentine Republic. Most of the information is of a botanical nature.

Sudan grass [*Sorghum* spp.] is innocuous when mature, but during periods of rapid growth followed by adverse conditions may become toxic owing to the presence of a cyanogenetic glucoside.

Astragalus Bergii (Leguminosae) owes its toxicity to saponin.

Solanum pseudo capsicum Linn., although highly toxic owing to the presence of solanin, rarely causes death, as the plants seldom grow in large numbers.

The fungus *Helminthosporum Ravenellii* or smut grass was not found to be injurious.

Baccharis ceridifolia (Compositae), which is common in the dry regions of the Argentine, was found to be highly toxic.—R. S. ROBERTS.

THERAPEUTICS.

NESTL, S. (1933). O djelovanju natrijeve luzine na virus ovčjih boginja. [**Disinfection Trials with Dilute Nitric Acid on Sheep Pox Virus**].—*Vet. Arhiv.* **3.** 237-249. 4 tables. [9 refs.] [Abst. from French summary].

The author tested the action of dilute nitric acid on the virus of sheep pox, and found that 0·5 per cent. killed sheep pox virus in five minutes in lymph diluted five times with water. A one, two or three per cent. solution killed it in one minute.

0·5 to 5·0 per cent. of dilute nitric acid did not kill sheep pox virus even after four hours in sheep skin having a thickness of 0·3 mm., but a 0·5 or 1 per cent. solution first heated to 80°C. and poured on such pieces of skin killed the virus in them in one minute. This was due to the heat, as distilled water or tap water heated to the same temperature also killed virus in such skin in the same manner.
—J. E.

MÖNNIG, H. O. (1933). **Recent Advances in the Knowledge of Anthelmintics.**—*J. S. Afric. Vet. Med. Ass.* **4.** 206-209.

The author discusses recent advances in our knowledge of certain anthelmintics such as carbon tetrachloride, tetrachlorethylene, hexachlorethane, n-butylidene chloride and hexylresorcinol. Carbon tetrachloride has been very widely used since 1921 in human and veterinary medicine, but the author considers its day is past, as more effective drugs such as tetrachlorethylene are available. Hexachorethane appears to be the best drug available for the treatment of liver fluke in cattle. Hexylresorcinol has been found to be a powerful anthelmintic, but has to be given after starvation and causes a local irritation of the stomach and intestines. Not much is known yet about the value of n-butylidene chloride, but it is less toxic than carbon tetrachloride.—E. M. ROBINSON.

SEELEMANN, M., & SIEMONSEN, K. (1933). Experimente und Beobachtungen an Milchkühen im Rahmen der Galtforschung. V. Mitteilung. Vergleichende Prüfungen verschiedener chemotherapeutischer Präparate zum Zwecke der Galtbehandlung unter besonderer Berücksichtigung der Akridinderivate. **[Research on Mastitis. V. Chemotherapy with Acridine Derivatives].**—*Arch. wiss. prakt. Tierhlk.* **67.** 10-43. 10 figs. [14 refs.] [For abstracts of previous articles of this series, see this *Bull.* **3.** 518].

The authors compared the value of the following substances in the treatment of chronic streptococcus mastitis by udder infusion :—four acridine derivatives, viz. " rivanol," " entozon," " parenchymatol J.," and " uberasan " ; " oxychinol " (similar to " chinosol ") ; two pyridine derivatives, " selectan " and " tolamin " (" azamine ") ; an $S.SO_2$ preparation and finally, boric acid.

The comparisons were made on milking cows that were infected, but showed a mild or moderate degree of inflammatory reaction. The method of treatment was similar to that used in earlier work in which " entozon " (1 : 1,250) was found to be a valuable chemotherapeutic agent [see this *Bull.* **3.** 160.] and in many cases where other agents failed to effect a cure a control test was made with " entozon." In most cases the agent to be tested was dissolved in distilled water to the concentration directed by the makers, and left in the udder for three to five minutes only. Two injections were given with an interval of about a week and bacteriological and chemical examinations were made at intervals afterwards. Charts of representative cases are given.

The acridine derivatives were definitely superior to all others. They had a good bactericidal action and were not unduly irritant, though some loss of milk occurred. " Entozon " is preferred on account of its relative cheapness and because it has been tested on a large scale. The remaining preparations were either too irritant or were ineffective.—A. W. STABLEFORTH.

I. SCHMITT, J. (1933). Fünfjährige Erfahrungen mit dem injizierbaren Hypnoticum Pernocton bei verschiedenen Haustieren (Hund, Katze, Schaf, Ziege, Schwein, Huhn). **[Experience with " Pernocton " Narcosis**

(Dog, Cat, Sheep, Goat, Pig and Fowl)].—*Arch. wiss. prakt. Tierhlk.* **67.** 46-78. 7 figs., 3 tables. [125 refs.]

II. GANSLMAYER, R. (1933). Prilog k pitanju djelovanja pernoctona. (Saopcenje I & II). [**The Pharmocology of "Pernocton." (Parts I & II)**].—*Vet. Arhiv.* **3.** 145-169 and 441-475. 49 figs. [44 refs.] [Abst. from summaries—Part I in French and Part II in German].

I. An extensive review of the veterinary and medical literature of " pernocton " a barbiturate employed as a basal narcotic. The author has used it for all small animal surgical cases requiring general anaesthesia presented at a clinic of the Hanover Veterinary College during the last five years. He also performed some experiments to ascertain the action of the drug on animal tissue preparations.

The chief disadvantage of " pernocton " in veterinary practice is that an overdose is likely to cause death and that it must be injected intravenously very slowly at a carefully computed dosage. In practice these difficulties are easily avoided by the use of the gravity principle (burette, rubber tube and needle).

The great majority of workers report very favourably on " pernocton " as a reliable basal narcotic for the dog and the cat, but its action is less intense on sheep, goats, pigs and fowls. Schmitt states that for dogs and cats a suitable dosage is 0·3 c.c. of the standard 10 per cent. solution per kg. body weight, but that two-thirds of this amount often works well.

II. These papers give the results of experimental tests with " pernocton " on dogs and cats, including tests with some antidotes against " pernocton " overdosage, lobelin, atropin and " hexeton," of which only the latter proved of any practical value.—J. E.

PHYSIOLOGY.

JOSLAND, S. W. (1934). **The Effect of Pregnancy and Parturition on Some Blood and Urinary Constituents in the Ewe.**—*New Zealand J. Sci. & Technol.* **15.** 358-363. 7 tables. [23 refs.]

No appreciable changes in serum calcium or magnesium were observed during a period of two months prior and six weeks subsequent to parturition. Inorganic P fell slightly a short time before parturition. Whole blood K fluctuated irregularly. Na was not altered up to the time of parturition, but there was a tendency to increase in the blood after parturition.

In the urine, albumen, sugar and acetone could only be demonstrated occasionally. NH_3 and N varied considerably. Total P was constant unless the ewe showed signs of *ante-partum* paralysis.—C. S. M. HOPKIRK.

HOLDEN, H. F., & FREEMAN, Mavis. (1933). **Observations on the Proteins of Ox Serum.**—*Austral. J. Exp. Biol. & Med. Sci.* **11.** 185-195. 4 tables. [11 refs.]

The proteins of ox serum were separated out by various treatments with ammonium sulphate. Their optical activity was examined and their rotations found not to be constant. It is therefore suggested that the proteins are not single proteins, but variable and unstable mixtures. Experiments were described on the supposed *in vitro* conversion of serum albumen to serum globulin.

—W. I. B. BEVERIDGE.

I. Robinson, W. G. (1933). **A Note on the Mineral Composition of the Blood Serum of the Horse and the Pig.**—*Third Rep. Dir. Inst. Anim. Path. Univ. Cambridge. 1932-33.* 156-158. 3 tables. [1 ref.]

II. Eveleth, D. F. (1934). **The Blood Chemistry of Swine. I. Blood Changes Following the Ingestion of Glucose.**—*J. Biol. Chem.* **104.** 559-563. 2 tables. [12 refs.]

I. Figures are given for the calcium, inorganic phosphorus, sodium and potassium content of the blood sera of 44 horses and 23 pigs. It is shown that the normal mineral composition of the blood is not the same in different species of animals. Horse serum contains about 20 per cent. more Ca than that of the pig or sheep. The P averages 8·48 mg. per 100 c.c. in the pig, and only 3·04 mg. in the horse ; it is intermediate in amount in the sheep. Na and K do not vary greatly between the different species.

II. The normal fasting blood sugar in eight pigs varied from 40 to 74 mg. per 100 c.c. of arterial blood. Glucose (0·8 g. per lb. body weight) was injected, and blood samples were withdrawn for examination at intervals up to four hours. The inorganic P fell in every case, and the amino-N increased, the maximum effects being observed half an hour after the peak in the sugar curve. There was no significant change in the urea and calcium.—Henry Dryerre.

I. Phillips, P. H., & Stare, F. J. (1934). **The Distribution of a Reducing Substance (Vitamin C) in the Tissues of Fluorine-Fed Cows.**—*J. Biol. Chem.* **104.** 351-358. 2 tables. [9 refs.]

II. Olcott, H. S., & Mattill, H. A. (1934). **Vitamin E. I. Some Chemical and Physiological Properties.**—*Ibid.* 423-435. 6 tables. [18 refs.]

III. —. (1934). **Cord Lesions and Vitamin-Deficiency.**—*Lancet.* **226.** 197-198. [2 refs.]

IV. Crew, S. K., Culhane, Kathleen, & Underhill, S. W. F. (1934). **Potency of Vitamin Preparations.** *Ibid.* 215.

I. Experiments carried out on Holstein dairy cows showed that vitamin C has a wide distribution in the animal body. It is very low in striated and heart muscle and very high in suprarenal cortex and the anterior lobe of the hypophysis. On the addition of appreciable amounts of fluorine to the diet the vitamin C content of kidney, liver, anterior lobe of the hypophysis and the suprarenal cortex was raised.

II. The data obtained from over four years work on physiological problems concerned with vitamin E are given. Paralysis of young rats of mothers fed on a vitamin E-deficient diet cannot be cured by administration of vitamin E after symptoms have appeared. When injected subcutaneously vitamin E has no effect upon the ovaries, uterus, opening of the vagina or cornification in the immature rat. Interesting data are recorded on some of the chemical and physical properties of vitamin E.

III. In this annotation the evidence for and against the production of spinal cord lesions by vitamin-deprivation is briefly discussed. The need for a thorough repetition of much of the work under precisely similar conditions and with a more exhaustive histological examination is stressed.

IV. The importance of uniform standard tests for the potency of proprietary vitamin preparations is stressed. Those containing vitamin A are difficult of uniform assay inasmuch as carotene, provisionally adopted as the standard, does not seem to act precisely as vitamin A, and the writers suggest that the Carr Price blue test or the extinction co-efficient as determined by spectrophotometry should be adopted by clinicians.—J. Stewart.

MURRAY, G. N., SCHUTTE, D. J., & DU PLESSIS, J. A. (1933). **The Effect of Barley, Millet** (*'n Yati-Pennisetum* **sp.) and Lucerne Meal in Bacon Production.**—*Onderstepoort J. Vet. Sci. & Anim. Indust.* **1.** 595-600. 1 fig., 2 tables. [4 refs.]

The object of the experiment was to obtain more information on the influence of a ration in which maize was partially substituted by millet. Half the meat meal ration was substituted by 15 per cent. lucerne meal. Pigs on millet and barley rations showed the best gains, but consumed the most food. The standard maize-meat meal ration proved to be the most economical in bacon production.

—E. M. ROBINSON.

MISCELLANEOUS.

UNION OF SOCIALIST SOVIET REPUBLICS. (1931). Wissenschaftliche Literatur der UdSSR, 1928. Systematischer Anzeiger der Bücher und zeitschriftlichen Aufsätze. Medizin. [**Scientific Literature of the U.S.S.R., 1928. Medicine.**] —pp. xxii + 739 + lxxvii. Moscow. [Copied *verbatim* from *Trop. Dis. Bull.* **31.** 291-292. Signed R. L. S.]

The comprehensive cataloguing of the scientific literature of the world, a project generally recognized as desirable, requires as a beginning that countries shall undertake to collect by local organization the material relating to their own national literature. Once national bibliographies are available, their bringing together to form an international record of the world's scientific output becomes possible. Working on these lines the organizers of the "International Catalogue of Scientific Literature," before the European War of 1914-18, had set up regional bureaux in various co-operating countries to collect titles of original contributions to scientific literature published within their national boundaries. The conditions resulting from the War brought this international organization to an end in 1915, and unfortunately most countries have allowed the cataloguing of their scientific literature to lapse. Soviet Russia is an exception, for, as an essential part of their second five-year plan, the All-Union Central Executive Committee of the U.S.S.R. established Commissions to compile indexes of current Russian literature, including the literature of science and agriculture.

The volume under review, which is one of a series of volumes relating to Russian scientific literature, contains a bibliography of Russian medical literature published during 1928. The main part of the work, including brief abstracts of the more important papers noted, is in Russian, but the classified list of contents and the titles of papers are given also in German for the convenience of non-Russian users. Entries are grouped so that papers on like subjects are brought together, and there are alphabetical authors' and subject indexes. In all 231 Russian medical journals have been indexed and 11,012 titles of medical papers published in Russia during 1928 have been noted. In comparison with other European countries, the size and complexity of the U.S.S.R. make the task of compiling yearly indexes of its scientific literature a gigantic one. Friends of the Soviet Union will claim that successful achievement is made possible by reason of the form of socialized Government within the Union, in which scientists and doctors are State officials and scientific and medical publications are part of the machinery of State. Whatever view is taken, the preparation of such national bibliographies of scientific literature is a service to the progress of science that other Governments might well copy.

OFFICIAL AND OTHER REPORTS.

I. VILJOEN, P. R. (1933). **Review of the Union's Agricultural Industry. Activities of the Department of Agriculture. Annual Report for the Year ended June 30, 1933.**—*Farming in South Africa.* **8.** 447-476. 17 tables.

II. DU TOIT, P. J. (1933). **The Union's Livestock Industry. Report of the Division of Veterinary Services and Animal Industry.**—*Ibid.* 477-485. 4 tables.

III. VAN DER POST, A. P. (1933). **Economic Conditions of Farming. Report of the Division of Economics and Markets.**—*Ibid.* 495-500. 17 tables.

I. The world depression combined with the unprecedented drought conditions in the Union rendered the position of the farmer very precarious, but relief measures adopted by the Government eased the position considerably. Improvement was noticed in the wool market, but not in that for mohair. Several further consignments of chilled beef were sent to Smithfield Market [London] and the reports on them were very satisfactory. The report includes a review of proposed methods to be adopted to combat soil erosion, one of the greatest menaces to the South African farmer.

A considerable amount of space is devoted to a review of the research work carried out by the department during the year. This includes the work done in the Division of Veterinary Services, which will be referred to under II. Valuable information was obtained in the breeding experiments with cattle under different environmental conditions in the Union. The pasture research experiments in progress at the Fauresmith Veld Reserve in the Orange Free State were greatly hampered by drought conditions, but valuable data continue to be obtained.

II. The report is divided into three parts (a) Field work ; (b) Laboratory work at Onderstepoort and (c) Animal Industry.

FIELD WORK.

The East Coast fever situation is reviewed and the satisfactory position emphasized. Fresh outbreaks were still being recorded, but with a very low mortality (less than 1 per cent.)

DOURINE.—The eradication campaign was interfered with by the foot and mouth disease campaign, but the initial tests have shown that the percentage of infected horses in dourine infected areas is in the neighbourhood of 10 per cent. Upwards of 15,000 tests have been made and, since the initial tests, the percentage of infected horses has greatly decreased.

FOOT AND MOUTH DISEASE.—In the early months of the year the disease broke out in the Union in proximity to the Bechuanaland border, but was eradicated by strict quarantine measures. An outbreak at Germiston, near Johannesburg, was eradicated by slaughter.

LABORATORY WORK.

Many interesting investigations were carried out at Onderstepoort.

HORSE-SICKNESS.—The transmission of horse-sickness to mice resulted in an attenuation of the virus for horses after several generations. It was hoped that the virus, attenuated by passage through mice, would form a suitable immunizing agent for horses after further passage through mice and guinea pigs.

FOOT AND MOUTH DISEASE.—During the outbreak of foot and mouth disease in the Union a number of suspicious cases were reported from the high veld of the Transvaal. The symptoms were somewhat similar to those seen in foot and mouth disease but further investigation showed them to be really cases of blue tongue of sheep occurring in cattle.

ANTHRAX.—Experiments with a vaccine made with saponin on the lines of "carbozoo" vaccine showed that it gave a very satisfactory immunity.

PHYSIOLOGY.—The influence of the formation of phylloerythrin from chlorophyll in photosensitization in sheep was studied and interesting results obtained.

ANIMAL INDUSTRY.

Valuable data continue to be obtained from the "grade herd" breeding experiment at Armoeds Vlakte in Bechuanaland. The first slaughter test of animals from this herd was carried out during the year.

III. The 1932-1933 wool season was much more favourable than the previous one. There was a record clip of 318,000,000 lb. which sold for £6,800,000. The position in the mohair trade, however, continued unfavourable. The trade in hides and skins showed an improvement during the year.

A commencement was made with the export of chilled beef and several experimental consignments were sent to Smithfield Market. These received comment.

—E. M. ROBINSON.

SUDAN GOVERNMENT. (1934). **Annual Report of the Veterinary Service, 1933.** [KENNEDY, W.] pp. 28. [fcp] [Mimeographed].

The report is divided into main sections on Staff, Diseases of Animals, Trade in Livestock and Products, and Improvement of Livestock. The Report of the Veterinary Research Officer is given as an appendix.

STAFF.

The field veterinary officers are assisted by native stock inspectors [semi-skilled], and veterinary tribal retainers who act chiefly as intelligence agents and, to a less degree, as inoculators. On the whole veterinary officers report favourably on them.

DISEASES OF ANIMALS.

"With the exception of cattle plague, the major diseases of livestock were much less prevalent than in recent years. This remark does not apply to the Provinces of Bahr-El-Ghazal and Mongalla as it has not so far been found possible to provide these provinces with veterinary staff. . . . . ."

RINDERPEST was prevalent throughout the year, but most serious in the dry season, January to July, consequent on congestion near permanent water supplies.

There were 891 [reported] outbreaks involving over 211,000 cattle with a death rate of 4·8 per cent. as compared with 503 outbreaks, 139,000 cattle and 6·33 per cent. mortality in 1932. Generally speaking there were no very large outbreaks in particular areas, but the disease was fairly evenly distributed throughout the country. It was as a rule promptly reported and serum supplies were adequate.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA was prevalent throughout the year, especially in Kordofan, Darfur and Upper Nile Provinces. In 48 outbreaks, of which details are available, 23,000 odd cattle were involved with a mortality of just over 2 per cent. including the destruction of infected cases. "The cattle owning tribes now have such confidence in the methods adopted [slaughter of infected cattle and vaccination of contacts] . . . . that they promptly report outbreaks and clamour to have their cattle vaccinated." In the Upper Nile, progress in obtaining the confidence of the [less intelligent] natives is slower ; in particular they object to the slaughter of infected cattle.

FOOT AND MOUTH DISEASE.—A few outbreaks were reported, but these quickly died out. As usual there were practically no deaths and the infected cattle made speedy recoveries with little loss of condition.

TRYPANOSOMIASIS.—Several outbreaks were reported from well-known infected areas in the South Central and Southern Sudan, but losses cannot be estimated with any precision.

OTHER CATTLE DISEASES.—Some psoroptic mange occurred in working cattle. An outbreak of haemorrhagic septicaemia occurred in the Blue Nile Province. A recently imported Jersey bull died of theileriasis [as did most of the bulls of European origin previously imported].

CAMEL DISEASES.—Diagnosis of trypanosomiasis by the mercuric chloride test and treatment with " naganol " have virtually eliminated this disease from officially-owned camels. Native owners present annually increasing numbers of camels for treatment [on payment of a fee barely exceeding the cost price of the " naganol "].

A certain amount of mange occurred, but this was easily controlled. " Contagious skin necrosis " was prevalent in Kordofan and Darfur.

EQUINE DISEASES.—There is nothing of especial interest to report, merely the usual outbreaks of epizootic lymphangitis, horse-sickness, trypanosomiasis and ulcerative cellulitis.

RABIES (chiefly canine) occurred in Kordofan, Mongalla, White Nile and Blue Nile provinces. " The total of six positive cases recorded this year compares favourably with that of fourteen in 1932, but the disease is still undoubtedly widespread." Stray dogs and other carnivora are destroyed so far as circumstances permit.

TRADE IN LIVESTOCK AND PRODUCTS.

Exports of cattle and sheep showed a slight improvement, the value being £E.24,210 as compared with the (record low) figure of £E.14,763 in 1932. Hide and skin exports recovered from the record low level to slightly over average, although there was no great rise in price. 1,207 tons of hides fetched an average price of £E.30, and 1,057 tons of skins averaged £E.48·9 per ton. Clarified butter exports continued to improve slightly, the total value being £E.24,640 as compared with £E.21,000 in 1932, in spite of lower prices.

The demand for cattle for local slaughter continued to be poor.

It is estimated that 27,000 camels were exported at an average price of probably £E.3·5 per head.

IMPROVEMENT OF LIVESTOCK.

It is considered that local cattle can only be improved by selective breeding from local types. At present improvement is largely limited to the castration of unsuitable young bulls.

Horse improvement is being effected by the use of imported, chiefly Arab, sires. A sufficient number of improved horses can be selected from their progeny for local military and police requirements.—S. C. J. BENNETT.

SUDAN GOVERNMENT. (1934). **Annual Report of the Veterinary Research Officer, 1933.** [BENNETT, S. C. J.]—*Ann. Rep. Sudan Vet. Serv.* 1933. pp. 20-28. [fcp] [Mimeographed].

" The year has been characterised by a general increase in routine work ; a slight decrease in the issues of pleuro-pneumonia vaccine has been more than counterbalanced by a slight increase in the number of specimens examined, an appreciable increase in the volume of cattle plague antiserum prepared, and a great increase in the issue of materials for the control of camel trypanosomiasis. Correspondence, and the total of stores etc. handled have increased proportionately. The Khartoum laboratory continues to grow more overcrowded, and the Malakal laboratory has attained its fullest working capacity."

Routine work and research are reported in separate sections.

ROUTINE WORK.

RINDERPEST SERUM PRODUCTION.—The aim is to produce 5,000 litres (at Malakal) and this year the total was attained.

" . . . every Laboratory Attendant was at some time or other sick with malaria. The number of Laboratory Attendants employed (seven) is considered to be an absolute minimum . . . . . and a breakdown was only avoided by their conveniently being sick one at a time." At one period a breakdown was threatened because of a high proportion of the cattle destined for use as virus producers were found to be immune. A threatening demonstration by some of the local labourers also caused anxiety ; nevertheless, working conditions throughout the season could be assessed as " generally favourable."

CONTAGIOUS PLEURO-PNEUMONIA VACCINE.—26,420 doses (of living culture) were issued as compared with 23,580 in 1931 and 31,200 in 1932.

CONTROL OF CAMEL TRYPANOSOMIASIS.—Issues of " naganol " and diagnostic outfits increased nearly threefold over those of 1932, the increase having been due to the growing demand for treatment (on payment) on the part of private camel owners. Observations on the year's treatments are the subject of a separate abstract [this *Bull.* **4**. 569].

SPECIMENS.—Most of these were uninteresting, being from ordinary cases of well-known conditions. The specimens worthy of recording were :—(1) A case of cutaneous *Globidium* infection in a horse. (2) Some anomalous cases of *Cryptococcus* infection, including a mule which showed intermittent purulent nasal discharge containing the organisms. On destruction after six weeks' observation no lesion could be found *post mortem*. (3) A case of " Vincent's angina " in the nostril of a horse. (4) Bovine haemorrhagic septicaemia (the existence of which has long been suspected, but which has never hitherto been definitely diagnosed by demonstration of *Pasteurella* organisms).

LIBRARY.—Books continue to overflow their accommodation and for financial reasons no periodicals have been bound for two years.

RESEARCH.

" Routine work, in both Khartoum and the Malakal laboratories has now attained a volume that leaves little scope for research. Records of large scale operations in the control of camel trypanosomiasis and bovine pleuro-pneumonia continue to be collected for subsequent analysis, but the only deliberate researches attempted have been in connection with cattle plague.

" At Malakal an attempt was made to continue research on the technique of preparing cattle plague antiserum but, owing to the delays already described in the section on routine work, the attempt had to be abandoned in order to produce the required volume of serum.

" In Khartoum research has been continued on cattle plague vaccine. This work, if reasonable progress is to be expected, demands continuity of observation, and the permanent appointment of the Assistant Veterinary Research Officer to the Malakal laboratory has rendered this impossible. Work is, however, progressing favourably though slowly, but owing to its technical nature and its present incomplete state, details of progress appear not to be indicated in this Report."

—S. C. J. BENNETT.

CEYLON. (1934). **Administration Report of the Government Veterinary Surgeon for 1933.** [CRAWFORD, M.] pp. 21. Colombo : Ceylon Govt. Press. [8vo] [25 cents].

STAFF.

There were no new appointments during the year. One assistant veterinary surgeon was sent on a scholarship to the Royal (Dick) Veterinary College, Edinburgh. Another assistant veterinary surgeon was sent for a 15 months special course of training to the Imperial Institute of Animal Husbandry and Dairying in Bangalore.

INFECTIOUS DISEASES.

RINDERPEST.—By the end of the year the incidence of rinderpest was very much lower than at the beginning and the prospects of complete eradication of this disease were good.

A brief review is given of the progress of the epizootic which was started in March, 1932, by cattle imported from India.

The view that rinderpest is not enzootic in Ceylon has been strongly supported by the results which followed prohibition of the import of cattle from India *via* Colombo in 1929. Since then there have been no fresh outbreaks in Colombo nor in the adjoining provinces, a period of nearly four years freedom, which is unprecedented.

Formalinized spleen vaccine prepared in the field continued to be used and proved useful in dealing with outbreaks in undeveloped jungle areas. It is not suitable for use in infected herds. Experience in the field appears to indicate that immunity conferred by one inoculation of spleen vaccine does not last longer than about six months.

A total of 3,035 cases was reported during the year. 286,425 c.c. of spleen vaccine were prepared in the field and 4,057 cattle and 5,842 buffaloes were vaccinated.

FOOT AND MOUTH DISEASE was reported from all the provinces except the North-Central. This disease is enzootic in Ceylon. In cattle of the local breed it is as a rule mild, but cattle of European breeds are severely affected.

ANTHRAX.—197 cases were reported of which 175 occurred among goats imported from India at the Municipal Quarantine Station, Colombo.

HAEMORRHAGIC SEPTICAEMIA.—A few cases in buffaloes occurred in Ratnapura District.

BOVINE TUBERCULOSIS.—The year was noteworthy inasmuch as a larger number of cases occurred in the 12 months under review than in the whole of the past 37 years of the Department's existence. In every case the affected animals were descended from cattle imported in the past from Europe or Australia. No cases occurred in cattle of the local breed. It cannot be presumed that local cattle are immune to the disease as they are seldom or never kept in contact with cattle of imported breeds. Special efforts were made to determine the extent of infection by inspections, tuberculin tests, milk tests and *post-mortem* examinations and it appears that this disease is largely confined to up-country districts. The organism responsible appears to be a typical bovine type as judged by its pathogenicity for guinea pigs.

The double intradermal tuberculin test was used and gave satisfactory results as checked by *post-mortem* examination of tested cattle.

MISCELLANEOUS DISEASES.

An outbreak of disease characterized by fever, enlargement of the liver and spleen and haemorrhagic spots on the conjunctiva in a small kennel of dogs was believed to be caused by *Bact. aertrycke* which was isolated in pure culture from the spleen of two of the dogs which died. Mortality was high and the duration of illness short, about seven days in most cases.

MASTITIS.—A type of acute mastitis in cattle is commonly seen which differs clinically from streptococcal mastitis. From two such cases a Gram-negative bacillus was isolated in pure culture. This bacillus was identified by the Director of the Bacteriological Institute as belonging to the *Bact. lactis aerogenes* group.

CANINE FILARIASIS.—About 30 per cent. of apparently healthy street dogs are

affected and the disease occurs in imported dogs, causing intermittent fever, loss of condition and intractable eczematous patches on the skin. Various treatments were tried without success. A *post-mortem* examination was made on a few infected street dogs and the adult worm was found situated in the subcutaneous tissues over the back and ribs. It appears to be *Dirofilaria repens*.

PLEURO-PNEUMONIA OF GOATS.—Intravenous injections of " novarsenobillon " again proved strikingly successful.

AVIAN MALARIA.—*Plasmodium praecox* was found in the blood of a number of imported fowls which were showing symptoms of illness and some of which had died. Treatment with quinine yielded successful results. Country-bred birds appear to be resistant. The organism has been found on several occasions in the blood of crows.

SURRA.—Three dogs treated with " Bayer 205 " were apparently cured.

RABIES.—This disease is prevalent throughout the island. The brains of 272 dogs were examined at the Pasteur Institute, 132 proving positive.

LABORATORY.

The work was confined to routine examination of specimens sent for diagnosis. 360 specimens were examined during the year and 3,400 doses of pigeon pox vaccine were prepared and sold.

ANIMAL HUSBANDRY.

The present unsatisfactory position was the subject of a special report to the government which was submitted in conjunction with the Director of Agriculture and was published as Sessional Paper XXVII—(1933).

Poultry breeding has increased considerably in the past few years and has been assisted by the prohibition of the importation of live poultry.

Increasing interest is being shown in the breeding of sheep and goats for mutton production and the importation of these animals is now restricted under a licence system.

The Government Dairy, Colombo, is in charge of the Veterinary Department and had a successful year. It produced over 40,000 gallons of milk and was run at a profit, there being an excess of receipts over expenditure of Rs.56,818.

The Government Farm at Ambepussa, also in charge of the Veterinary Department, acts as a " feeder " for the Government Dairy. Goats and poultry are also reared.

An interesting observation during the year was the marked improvement in the health, birth-rate and death-rate of the flock of goats ; this was the result of the supply of a simple mineral mixture consisting of equal parts of common salt, slaked lime and bone meal.

Deaths from parasitic gastritis in calves showed a very marked decrease, being only nine as compared with 36 in the previous year.

The poultry section was increased during the year. The first batch of farm-bred Rhode Island Red pullets had an average egg production of 116 eggs in six months.

Experiments were made with a view to utilizing local food-stuffs such as paddy, kurakkan, rice, bran, coconut poonac, fresh grated coconut, yams and sweet potatoes.

The animal population comprises :—cattle, 1,084,997 ; buffaloes, 529,119 ; sheep, 58,770 ; goats, 204,927 and swine, 45,000.—M. CRAWFORD.

BOOK REVIEWS.

STEYN, D. G. [B.Sc., Dr. Med. Vet. (Vienna), D.V.Sc., Head of Dept. Pharmacol. & Toxicol., Onderstepoort Laboratories, Transvaal]. (1934). **The Toxicology of Plants in South Africa together with a Consideration of Poisonous Foodstuffs and Fungi.** pp. xii+631. 135 figs., 9 tables. [28½ pp. refs.] S. Africa: Central News Agency. [4to] [£2. 7s. 6d.]

This book is destined to become a standard work of reference and no library shelf on poisonous plants can afford to be without it.

Although individual toxicologists may disagree with the author on particular issues, that is no criticism of a book which contains so much information derived from direct experimentation and first-hand observation, and which is so ambitious in scope. South Africa abounds in plants poisonous to livestock and much of the information on them is here assembled for the first time, along with the relevant world information on ubiquitous plants. The point of view is experimental and the volume is a tribute to the Onderstepoort Veterinary Laboratories from which the author writes and to the botanical assistance which he acknowledges from the Division of Plant Industry in Pretoria.

The veterinarian will welcome the book as one which not only classifies the plants botanically, indicates their geographical distribution, and states the pharmacological principles where known, but also describes symptomatology and *post-mortem* findings in cases of intoxication and offers suggestions for prevention and treatment. A noteworthy feature is the excellent photographic reproduction of a large number of plants, and of a few typical clinical cases of certain diseases produced by poisonous plants, e.g. alopecia produced by *Chrysocoma tenuifolia*, "pushing disease" produced by *Matricoria nigellaefolia* and photosensitization produced by *Tribulus terrestris*.

The volume is divided into a general portion of 23 short chapters covering 72 pages, and a major section of 493 pages on "special toxicology of plants." The bibliography of 28 pages will be found exceedingly useful by scientific workers in other countries. Exigencies of space prevent more detailed consideration but it should be added that the book is not only essential to veterinarians, agriculturalists and botanists in all countries in which stock poisoning is common, but should be of general interest to pharmacologists, toxicologists and physiologists who may find much that is new to them, e.g. the long "latent period" in poisoning of sheep by *Vangueria pygmaea* and the highly restricted "species susceptibility" in *Matricaria* intoxication of the bovine.—H. H. GREEN.

RENNES, J. [Director of veterinary services, Seine-et-Oise]. (1933). Manuel du préposé à l'inspection des viandes. [**Meat Inspection**]. pp. 88. 54 figs., 2 tables. Paris: Vigot Frères. [8vo] [Fr.15].

As the author states, food inspection is a public duty for the purpose of withdrawing from consumption food which is unfit for that purpose, and should be carried out on the basis of the correct distinction between meat which is normal and abnormal. There should come under inspection living animals including those used by the butcher and pork-butcher, also game, poultry, fish and shellfish. If this is done correctly, two essential features are performed (1) protection of the honest trader and (2) protection of the public health.

Rennes' little book contains briefly much valuable information and some of the diagrams are useful, although others are of utility only in France, due to the difference in the methods of cutting up carcasses. The positions of the various lymph glands are shown clearly, not only in the organs and carcasses, but also in

the live animal. The author emphasizes what has already been stated in the papers on the subject, viz. that in France "Meat inspection is not organized by the State, it is as in England, a Municipal Service," based on the Municipal Law [France] of April 5, 1884.

The book has been intended for the lay inspector, who works in conjunction with the veterinary inspector, and for this purpose it is very well written. It describes the functions of the officer and the knowledge he should possess. It describes also how to examine the living animal so as to call the attention of the veterinarians to abnormal conditions, how to examine carcasses and organs, when to stamp or to refuse to stamp meat, the inspections in markets, how to distinguish the sex of dressed carcasses, how to distinguish species and recognize organs and the examination of sausages, prepared foods, poultry, game (furred and feathered), fish and shell-fish ; also how to make seizures and to institute proceedings in law courts.

The book concludes by giving the text of an Order in Council, issued by the Superior Council of Public Hygiene in France, which has been adopted by nearly all the Prefects of the Departments.—T. Dunlop Young.

Lockhart-Mummery, J. P. [M.A., M.B., B.C., F.R.C.S., Senior Surgeon St. Mark's Hospital, Chairman, Executive Committee and Editor, Ann. Rep. Brit. Empire Cancer Campaign]. (1934). **The Origin of Cancer.** pp. ix+150. 29 figs., 8 plates. [77 refs.] London: J. & A. Churchill. [8vo] [12s. 6d.]

No scientific subject has had so much time, money and effort devoted to its solution as cancer. The literature on the subject is voluminous and some of it is confusing and misleading.

In presenting this book the author claims that now, for the first time, it is possible to build up a theory of tumours which enables a logical picture of the whole process of tumour formation to be constructed and which explains all the known facts about them. This theory is the theme of the book and it supposes that all tumours are the result of mutation of one or more genes in the nucleus of a cell which makes for more frequent rate of division in that cell and its descendants.

Of the ten chapters comprising the book, the first three deal with our present knowledge of tumours, old theories about their causation and a study of normal and abnormal growth, the author maintaining that the solution of the cancer problem is to be found, not in the study of diseased tissues, but in the study of the normal cell. In chapter 4 the author discusses the relationship between heredity and tumour formation and states unequivocally that a susceptibility to cancer is inherited. Chapters 5, 6, 7 and 8 are devoted to the genetic theory of inheritance, somatic cell mutations, the essential difference between simple and malignant tumours and the factors governing malignancy, and the stability of genes and the frequency of mutations. In chapter 9 the genetic theory is applied to avian tumours and in the final chapter the author discusses how the theory affects the present treatment of cancer and the prospects for successful treatment in the future.

The subject matter is very well presented and the author's theory is developed in a very stimulating and convincing manner. He is to be commended on the very able way in which he has written an essentially genetical discourse without burdening it with unnecessary technical terms.

It is perhaps too much to hope that such an apparently simple explanation of the causation of tumours will lead to an early discovery of a successful method of treatment.—Gwilym O. Davies.